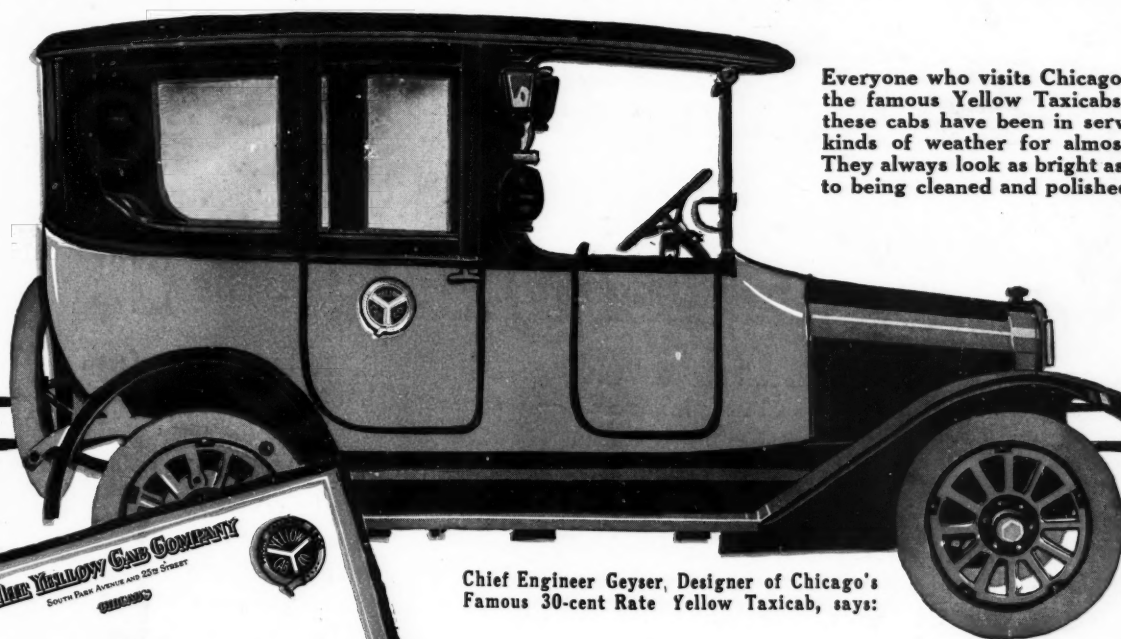


# MOTOR AGE

Vol. XXIX  
No. 1

CHICAGO, JANUARY 6, 1916

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# MOTOR AGE



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No. 1

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## The Handbook of the Chicago Show

For the thousands of motor car enthusiasts, prospective owners and dealers who do, or do not attend—

## The Chicago Show Issue of Motor Age

(Dated January 20th)

—will be the Handbook of the Chicago Show.

Your advertising copy in this feature issue will systematize your prospects' visit to the Coliseum. Depend upon it—rather than the tiring drift of the crowd—to bring them with a preconceived determination and an open mind, to visit your reservation—

Or, if you do not exhibit, to impress upon them the merits of your product and your ability to serve.

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And consider that the overwhelming majority of owners, prospects and dealers will go to the Chicago Show only through the columns of "The Motoring Authority of America."

Make Your Reservations Early

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—not a novelty; but a **GREAT Selling Campaign** for Studebaker Dealers

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## The Motor Revue of 1916

NEW YORK, Dec. 31—Gaby Deslys, formerly listed as chicken à la king on the international menu, is playing to standing room only at the Globe; Sousa's band and "Hip! Hip! Hooray!" are a knockout at the Hippodrome, but the biggest and most popular show in all of show-mad New York is the Motor Revue of 1916, Samuel A. Miles' sixteenth annual production, which opened at the Grand Central Palace at 2 o'clock this afternoon for a limited engagement of 7 days.

The cast and chorus of the Palace production totals 326 cars and chasses, gasoline and

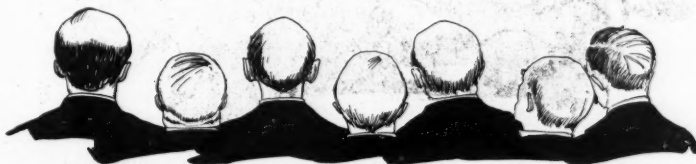
By Darwin S. Hatch

electric, sponsored by eighty-four manufacturers, and 307 accessory exhibits, an aggregation of mechanical talent that should inspire the press agent to soar to the highest peak of the superlative adjective range.

With but one exception, it is a home talent show as all but one member of the

cast are American bred. The foreign artiste, however, has attained stellar honors, the Fergus, imported from the land of the shamrock, having attracted a great amount of attention already.

When the curtain went up on today's matinee, everything was in readiness for the gorgeous premiere. The show, as a whole, is staged on four floors as usual, the motor car exhibits occupying the main floor, the mezzanine floor and a portion of the balcony, while the entire fourth floor and the remainder of the balcony is given over to the display of accessory





New marine body on 1916 Cunningham

parts. The show is more than filled to capacity.

The interior of the Grand Central Palace, architecturally imposing as it is, with its rows of dual marble columns, was given a regal effect by the combination of maroon and royal blue hangings in the scheme of decoration, together with a very extensive use of trailing rose vines on the walls and balconies. On the main floor, the twenty imposing Corinthian columns, which form the central court, are treated with hangings in deep blue draped from the bays between the tops of the columns and gathered near the base; the valances are edged in gold braid.

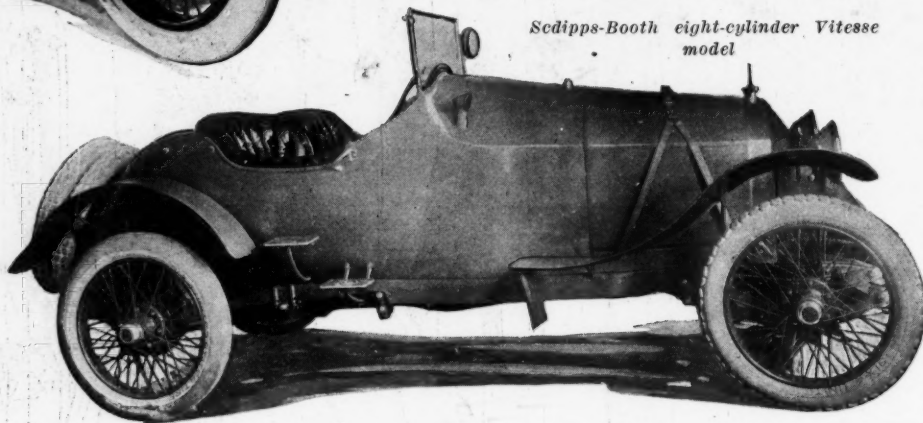
#### Light From Great Chandeliers

The chief source of illumination is from mammoth chandeliers of original design. Each chandelier glows with eighteen balls of fire enclosed in frosted globes and glass of various hues is used in a way to make the chandelier a riot of light.

In the lobby, the draping of the velvet portieres partially screens off the display of cars and decorations beyond. As one passes up the steps into the lobby is revealed the Palace of Motoria, the goddess who watches over the destinies of the motor car industry. Motoria has been visualized in statuary and has graced a number of shows of the past. The sculptor has given her the form of a shapely girl standing aloft with hands outstretched upon a steering wheel, and with her scant drapery blowing in the breeze.

Surmounting the Corinthian column, the upper corice, which forms the railing of the second mezzanine floor, is decorated with rose vines and upon this floor the hundred doric columns are woven with vines into a pergola effect.

The exhibition of cars and accessories is illuminating as to the progress



Scdipps-Booth eight-cylinder Vitesse model

that has been made in the past year both from the standpoint of body design and from that of the mechanical engineering features. Naturally, the greater proportion of visitors are impressed mostly with the displays of new bodies, but to those who are familiar with the mechanics of a motor car, the stripped chassis and cut-

away views of motors tell a more poignant story of the growth than do the numerous examples of the body builder's art.

A census of the show serves to give a very good idea of the relative popularity of the manufacturers of different designs and constructions; particularly is this true as regards the different body types, because it is logical to assume that the body types which may be considered as appealing to the public fancy to the greatest degree may be in evidence in greatest numbers at the palace.

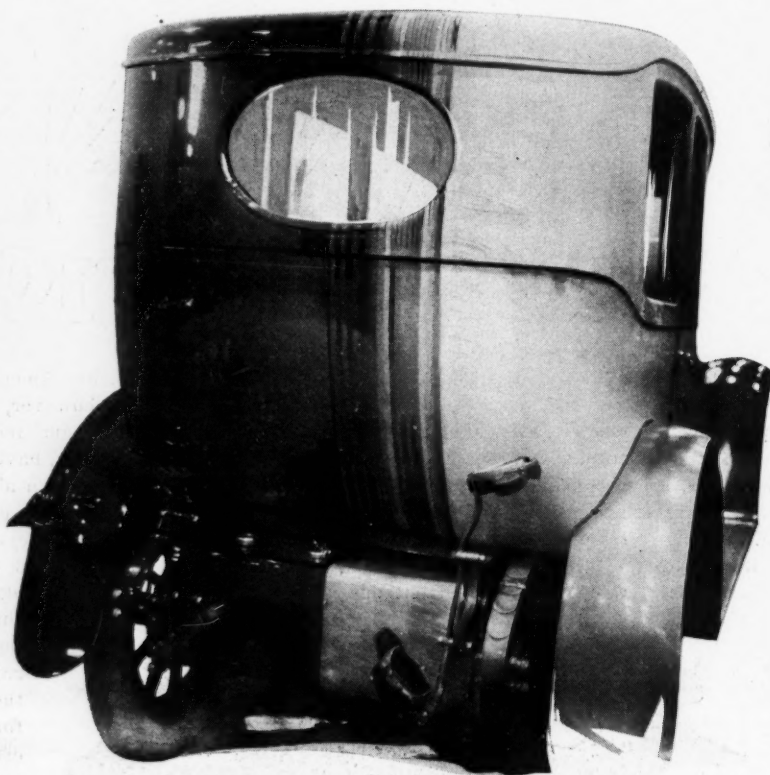
#### Most Five-Passenger Cars

Of the 326 complete cars and chasses which are on exhibition quite naturally the five-passenger touring car leads the

list. There are sixty-four of these, fifty-three six- and seven-seaters, thirty-six two-passengers, twenty-five three-passengers and sixteen four-passengers. This comprises the roster of the open cars. It is of interest to note that the three-passenger roadsters are almost as much in evidence as the two-passenger bodies. The clover-leaf idea is to be thanked to a great extent for this.

Among the enclosed cars, the demountable top idea has the call and it is an evidence of very rapid growth in popularity of the convertible body that there are fifteen of this type at the palace, while the limousine, the next nearest in numbers, are there in force of twelve only. The cabriolets, which is the convertible roadster type, and the town cars have five representatives each; the landaulets have three, while the coupes and sedans, of course, are more in evidence, eleven of the latter and six of the former.

Of the fifty-four stripped chasses on exhibition, twenty-two are four-cylinder, nineteen are six-cylinder, nine are eight-cylinder and four are twelve-cylinder chasses. Of the whole number of exhibits of complete



Rear view of new Kissel, showing different coats of painting

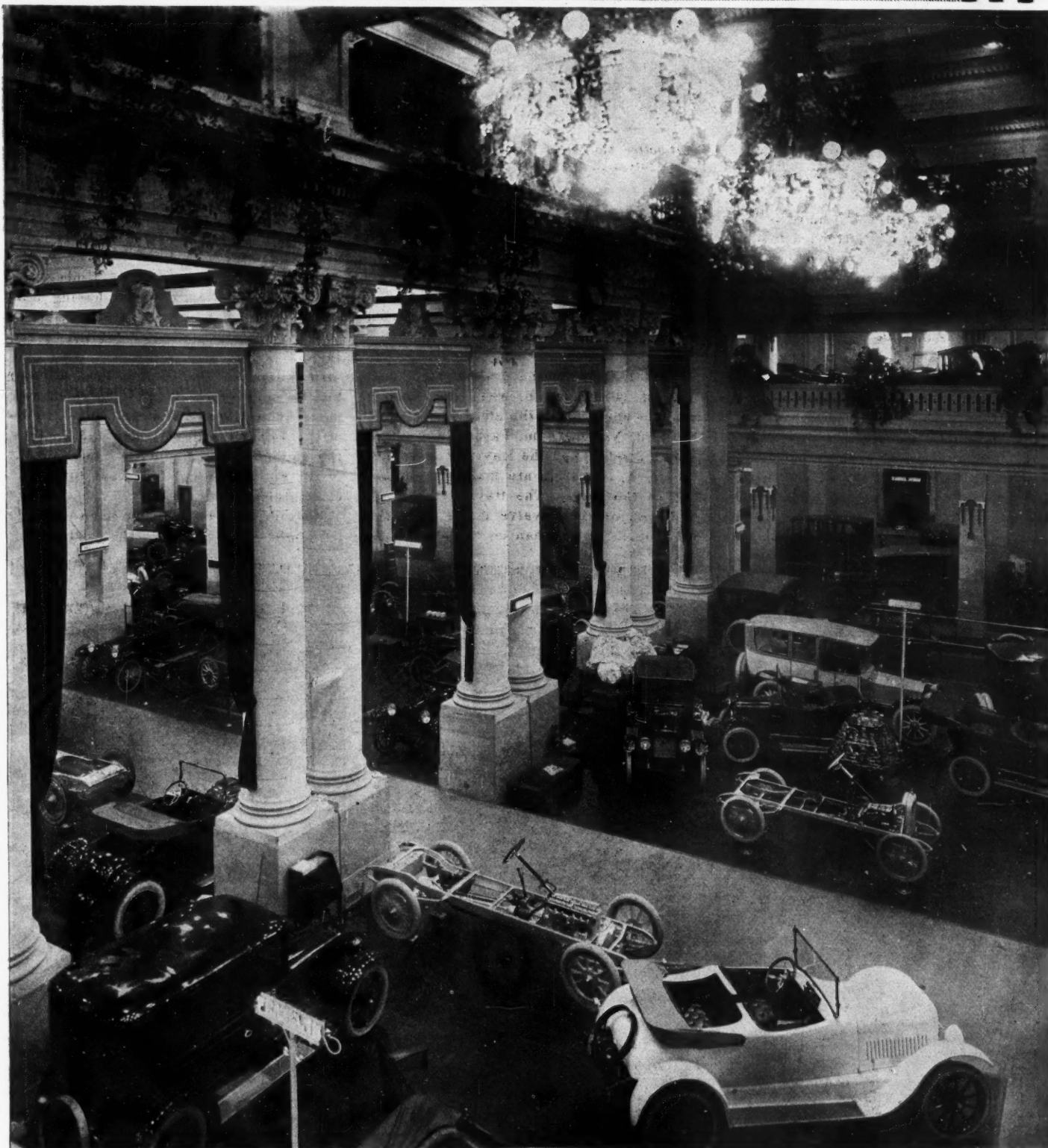
cars and chasses, the six-cylinders lead with 136. There are 116 four-cylinders, forty-two eights, and thirteen twelves.

There are six electric vehicles on display, the list comprising the Baker Rauch & Lang, in both the R. & L. and Baker type, the Detroit, Milburn, Waverley and Ohio.

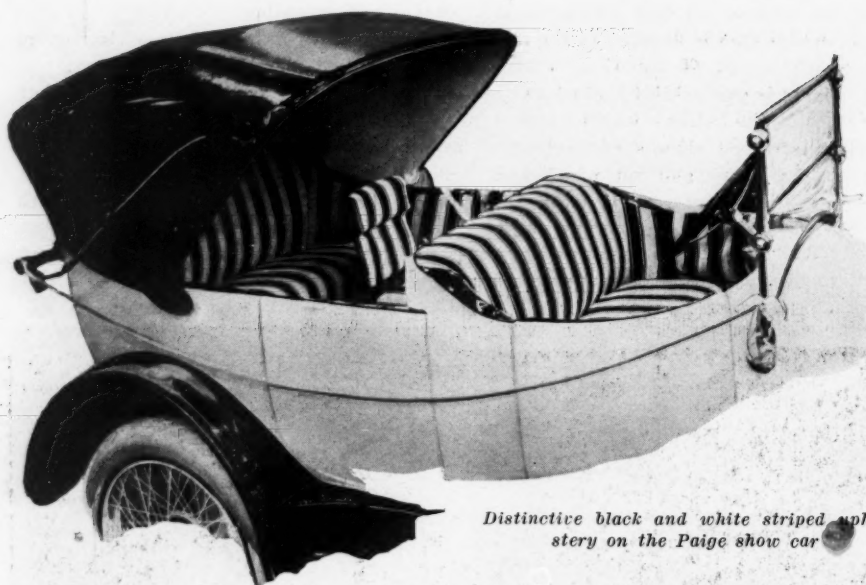
It is rather a blow to our pride of coun-

try that the most of the talk among those who know motor cars is devoted to the one exhibit which is not of American manufacture. There is one exhibit tucked away in the corner of the balcony which consists of merely a stripped chassis without any gilding or decorations and yet which has a larger crowd of interested engineers and motorists, today at least, than most

of the more elaborate displays on the lower floors. This is a lone visitor from Ireland called the Fergus, and the interest it is arousing is due to the fact that it more nearly reaches the ideal of the owner-driver from a maintenance standpoint than does any design that has been offered before. There is only one part about the car which needs lubrication



A view of the main floor of the Grand Central Palace with cars and stripped chassis on exhibition



*Distinctive black and white striped upholstery on the Paige show car*

oftener than once in 6,000 miles. There is not an oil hole to be attended to daily or weekly; there is not a grease cup to be turned down daily; and there is not a point in the entire oiling of the car except the customary replenishment of oil in the motor that needs attention.

#### **Parts Are Protected**

Not only is the oiling of the clutch, gearset, and even the springs cared for automatically, but such places as ordinarily would be damaged by the dust or dirt of the road are thoroughly covered by neatly fitting leather boots or leather plates which not only retain the lubricant, but keep out foreign matter. The springs are oiled automatically through leads that

run from the circulating pump which supplies the gearset with oil. There are no brake rods to give trouble because cables are used as connections. The starter, motor, and generator are mounted alongside the engine base and are practically housed within it by easily removable aluminum covers.

Next to this unusual chassis, the most interest is divided between the twelve-cylinder engines and the aluminum motors. Packard, National, and Pathfinder twelves are on display, and the Haynes twelve and the H. A. L. twelve are making their debut at the show. The Haynes turns out to be an overhead valve motor with the valve-operating mechanism completely en-

closed, and quite neat in design throughout.

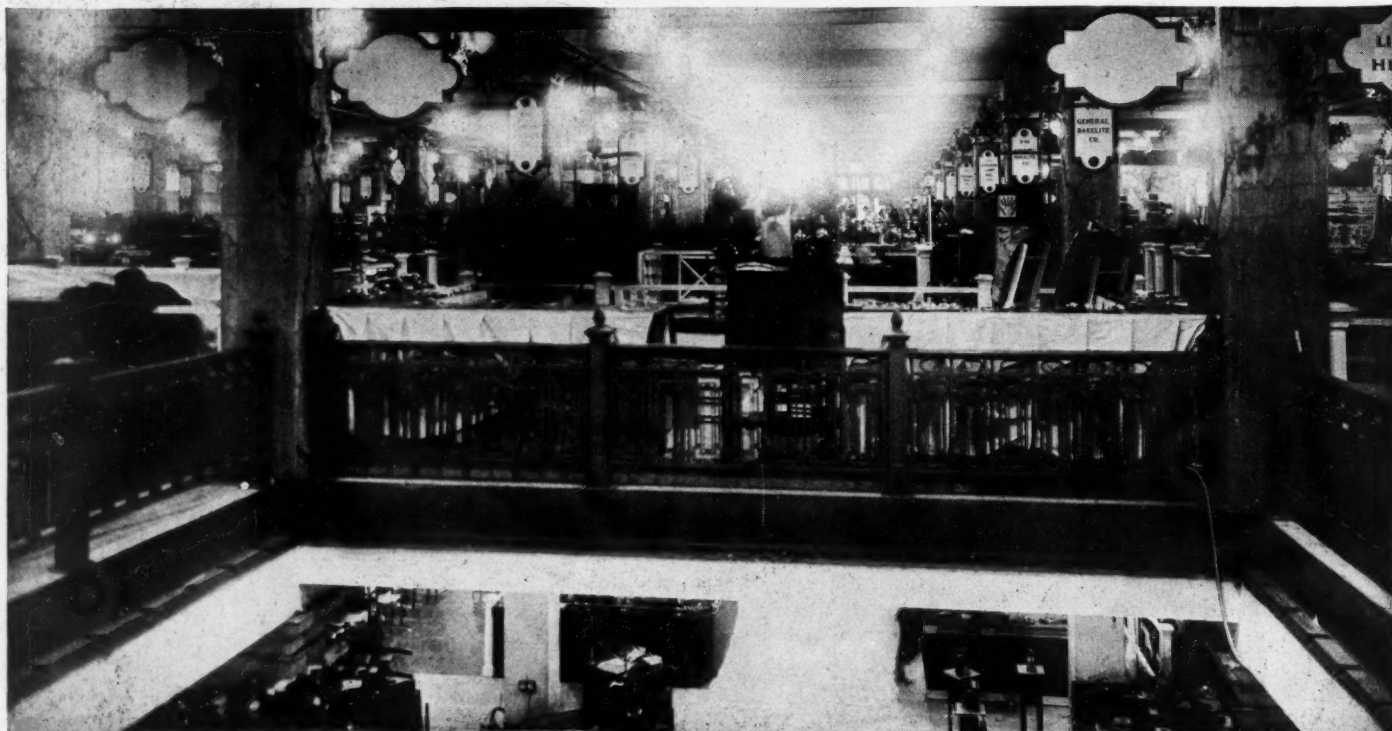
The new Marmon, with its aluminum cylinders and three-unit aluminum body, naturally is an object of a great deal of attention, although the eights are not the novelty that they were at last year's exhibition, they still are commanding a great deal of attention. The latest and most interesting of these is the new Scripps-Booth with its overhead valves which are enclosed.

#### **The Debutantes of 1916**

Among the other cars which are making their initial bow to the public at this exhibition are the new Lozier six, the new Briscoe 24, the new Case, Paige six, Abbott, Studebaker, the new Hudson Super-six, Cunningham, Peerless, and Sterling. The Hudson naturally is a center of interest on account of the remarkable showing it made recently in the test conducted on the Sheephead Bay track. The only extraordinary feature from the point of outside appearance of the car is the rather unusual carburetor of Hudson design which is credited with having considerable to do with the surprising speed and acceleration qualities exhibited by the car.

Considerable comment has been aroused by the appearance of an unheralded new name among the cars at the show. This is the Lescina which is manufactured by the Lescina Automobile Co., in Newark, N. J. and Chicago. It seems to follow conventional lines.

Body designs are offering some interesting studies particularly in the combination



*View of the accessory exhibits on the fourth floor of the Grand Central Palace*



Another view of the New York show with Studebaker stripped chassis, made of solid gold, in the foreground

of a double cowl idea with a vestibule body or divided front seat. This has been worked out in quite a novel way by a number of concerns with cars on display at the show.

The clover-leaf roadster idea has developed from the three-passenger affair, which was shown in one or two stands last year, to a four-passenger design in which all four persons are within practically the same compartment without the distinct tonneau which ordinarily is to be expected in a car seating more than two persons. Some of these designers have simply broadened the third seat of the clover-leaf idea while others have developed two distinct seats at the rear of the divided front seat. Some of these ideas are illustrated in other pages.

#### Slanting Windshields Common

The racy effect which is attained by the slanting windshield, a design that has been imported from Europe, seems to have taken the public eye and one or two exponents of this arrangement last year have been augmented by a considerably larger number for this season. Among those cars at the show, in which the rearward inclined screen is employed, may be men-

tioned the Briscoe, Olds, Case, Cunningham, Fiat, Standard, S. G. V. Owen, and Abbott.

Convertible tops have found a definite place in the programs of the manufacturers if the New York show is any criterion. Fully three-quarters of the exhibitors of cars are showing some sort of a combination winter and summer vehicle and while this is not a new movement it is one which has received an unexpected impetus this season.

#### Curtailement of Grease Cups

The Fergus has not been alone in the development of this idea of easier maintenance for the owner-driver, although it is certain that the Irish car is far and away ahead of anything developed as a production design in America. The new Hudson Super-Six has been simplified so far as the lubrication features are concerned so that the newest design has only four grease cups to be attended to. The New Scripps-Booth eight and the Briscoe both employ valve adjustment outside of the valve cover so that this feature of car maintenance can be attended to without much difficulty and without the necessity of even removing the silencing

housing for the rocker arm. Similarly, the lubrication of the rocker arms has been arranged so that this could be attended to through the valve cover.

#### Car of Black and White

Special show jobs there are in plenty, in the form of out-of-the-ordinary body designs, unusual colors and finishes and highly polished and cutaway chasses. The present vogue of the blacks and whites in checks and stripes has found its reflection in color schemes of several of the cars and in a great number of instances, in the combinations of shades of the seat coverings. One instance in which this idea is carried out quite completely is the Paige six, a touring car, a special show job in white with black stripes. Such of the vertical or nearly vertical lines as the louvers in the hood are in black on the white background; while the seat covers are broad stripes of black and white which give a very striking effect. They also lend an air of massiveness to the car.

Cunningham has a very unusual body design in which the boat idea has been carried out to a rather unusual direction. This is a close-coupled, four-passenger job

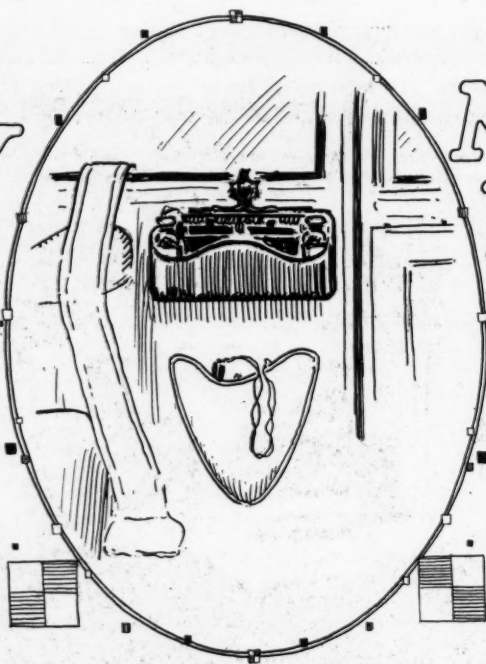
(Concluded on page 27)

# For Milady and Her

# Motoriste Escort

USUALLY discussions aroused by the annual motor car exhibitions become quite technical in their nature and confine themselves mostly to the mechanical features of the car, somewhat to the exclusion of the less technical, but equally important, features which go to make motoring comfortable. Americans no longer are devoting their attention solely to the engineering end of motor car building. The strictly mechanical features of the car, the wheels and the parts which make the wheels go round, have ceased to be the whole thing to the designer. More attention is paid every year to what might be called the luxury features of the car as distinguished from the necessity or mechanical features.

Milady motorist has come into her own this year more than ever before so far as the respect paid her by the designers is concerned. Practically every one of the inclosed bodies, and not a few of the tour-

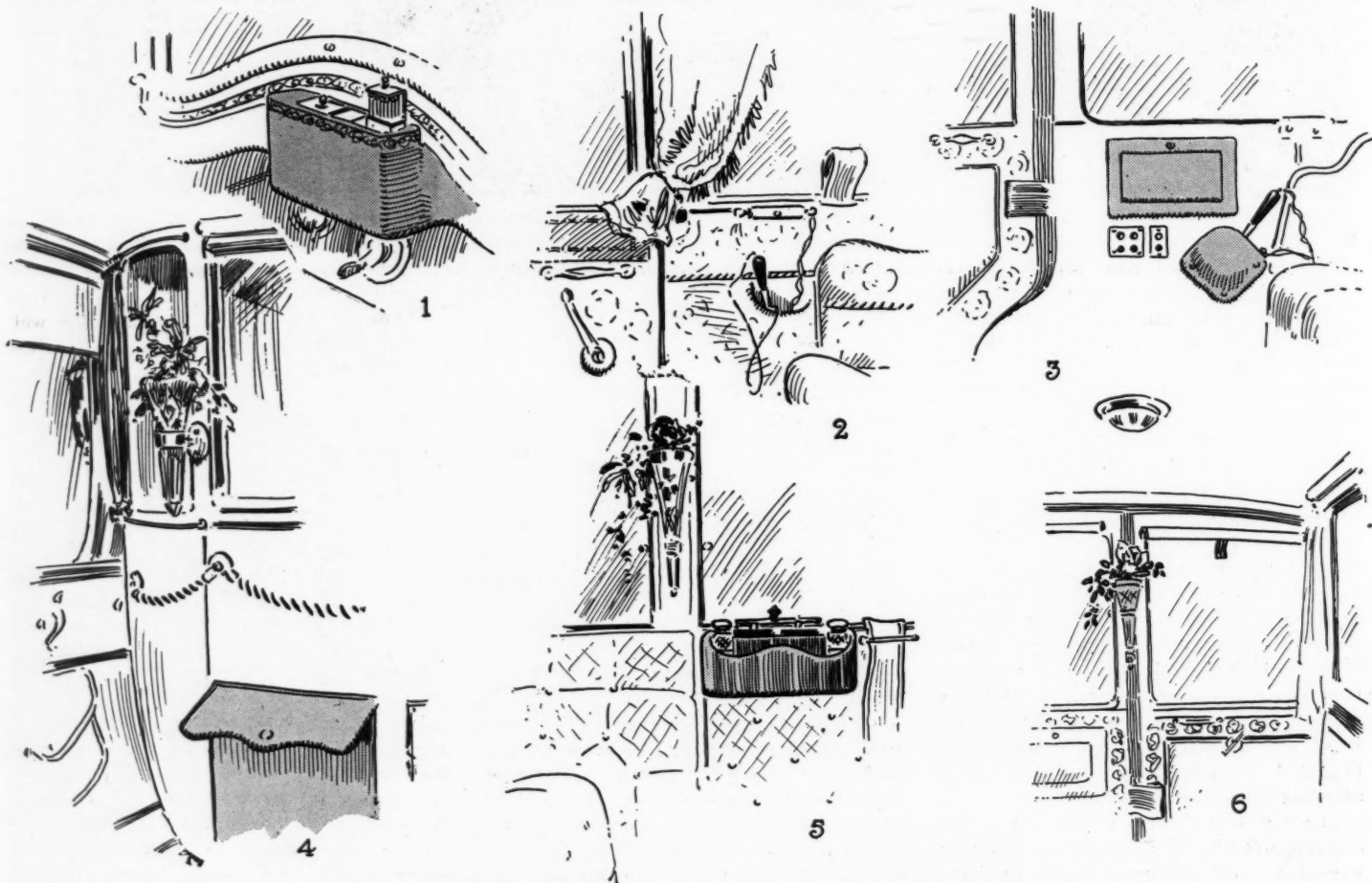


*This is how the McFarlan disposes of the telephone and vanity case*

ing and roadster types, have shown the softening influence of the feminine point of view and exhibit the effect of the woman's hand at the wheel. In the more luxurious inclosed bodies in particular, the

limousines, town cars, coupes, wherein our feminine motorist and her escort make their trips to ball or opera, we find the little added refinements of motoring for which the woman motorist is to be thanked.

Vanity cases are numerous, and quite variegated both in form and location. The favorite location for the toilet accessories seems to be at one side under the window, while at the opposite side is the smoking outfit for the gentlemen. The latter quite frequently is mounted on the forward wall which is in easy reach and sometimes found accompanied by an electric cigar lighter. In the small coupes in which the seats are staggered, the space behind the forward seat is quite likely to be arranged as a slipper box or fitted up for some kindred purpose. Quite frequently, a neat pocket is arranged for carrying the driver telephone. It was not so long ago that the in-



1—The Scripps-Booth provides matches for the smokers in one end of the car

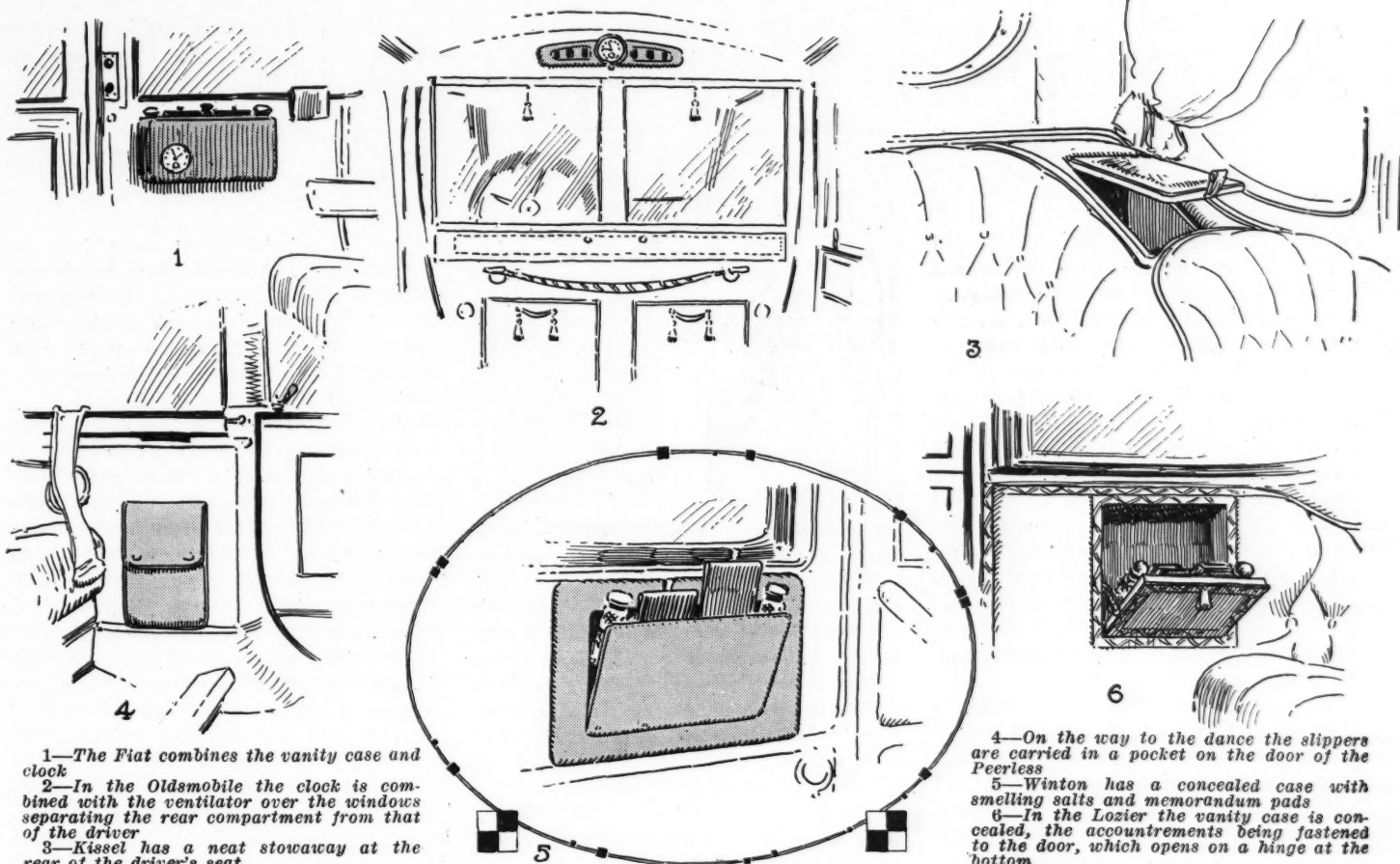
2—Telephone equipment found in the Oldsmobile that the fair passenger may direct the chauffeur. The instrument is carried in a pocket in the side of the car

3—The telephone in the Mitchell carries the telephone in a handy pocket and the vanity case is in a locker

4—How the flowers are carried in the Winton. The draperies are on silver-plated rails

5—The National inclosed cars carry vanity cases and smelling salts as well as flowers

6—Flowers are a part of completely equipped with inclosed cars. This shows how the Mitchell designer arranged for carrying a bouquet in the inclosed car



1—The Fiat combines the vanity case and clock

2—In the Oldsmobile the clock is combined with the ventilator over the windows separating the rear compartment from that of the driver

3—Kissel has a neat stowaway at the rear of the driver's seat

4—On the way to the dance the slippers are carried in a pocket on the door of the Peerless

5—Winton has a concealed case with smelling salts and memorandum pads

6—In the Lozier the vanity case is concealed, the accoutrements being fastened to the door, which opens on a hinge at the bottom

stallation of the flower holders assumed their variety of forms and locations about the interior but this point seems to have become well standardized in the panel between door and window.

It is at the salon at the Hotel Astor that the lady motorist comes into her own, for here are displayed many of the attractive body types made by some of the foremost bodymakers of this country and one or two from abroad. It has been their desire to afford every conceivable convenience for her excellence and recognizing that the closed car is primarily for milady, the designers have spared nothing that will add to the enjoyment of the time she spends a-motoring.

Generally speaking, there is a marked improvement in the comfortableness of seats and cushions to afford the acme of ease when riding, and besides this many of the new upholstery are suedes which has a tendency to cling to the clothing and prevent sliding when rounding curves and the like. Some special examples of this are a green suede interior in an Owen Magnetic car and old rose in a special Holbrook body on a Cadillac.

In the bodies at the salon, toilet cases and cigar lighters abound, for it is a well-recognized fact that the lady passengers must powder their noses and the men complacently smoke their Pall Malls as they ride along. Anyway the toilet cases and smoking articles serve to fill an otherwise blank space at either side of the car just back of the door and they are things that appeal. In an Armstrong body on an Owen

Magnetic there are some gilded instruments that one would almost expect to see on the dressing table instead of the motor car. There are perfume bottles, a mirror and a brush in gold that bear the name Tiffany as proof of their exclusiveness. The demonstrator points to them with pardonable pride as he murmurs the magic word that means par excellence in jewelry. No mere toilet articles will do for the American Queen who graces this equipage.

#### Special Smoking Sets.

All of the Holbrook bodies possess these articles and in the gentleman's set the smoking articles are handily arranged so that it is very easy to imagine you are in the den of a luxurious home. Lift the lighter from its clip and press a button, Presto! you have an electric heat that puts matches to shame. Suppose the lighter gets out of order; in that case the match holder which is a part of the set can be lifted from its place of concealment, but there must also be some place to flick your ashes, and to care for that contingency there are two little places made to receive them.

In a number of the bodies there are little lights in the sides of the running-board apron to illuminate that portion of the running-board on which the lady must step in entering or leaving the car. There must be no possibility of her slipping or missing the step in the darkness, and the lights are controlled by the chauffeur so that they are switched on or off as needed. This is truly a refinement of a big utility value and is seen in the cars of Locomobile and Owen make at the salon.

Some of the windshield effects are also most desirable from the lady passenger's point of view. These are the rear seat shield that fastens to the back of the front seat, and the V-shaped front shield that is in two sections. It is ever a source of annoyance to the feminine mind to know that her hair and hat are being blown in all sorts of ways by the wind that rushes by the speeding car, and she welcomes a chance to take refuge against such rudeness of the elements behind a windshield. So the Bender-Robinson body with the shield for the rear seat is especially commended.

The feminine point of view as regards the V-shaped front was gained by overhearing a conversation between a lady visitor and one of the exhibitors showing this type. He explained its advantages from his idea, but the lady enlightened him with the remark that having two individual shields on the V front made it possible for her to sit beside the driver in comfort on rainy nights and at times when the wind was objectionable. It is almost essential that the shield be opened somewhat when it is raining so that the driver may see where he is going, but with the double construction, the side opposite may be kept closed all the time.

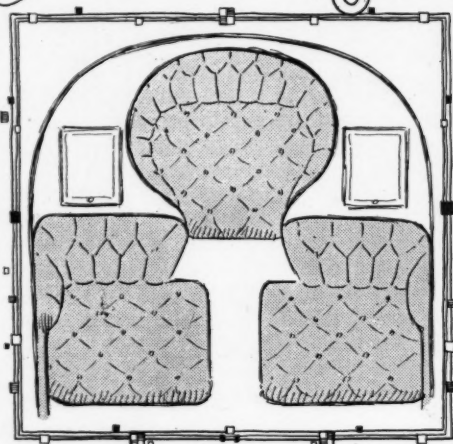
Attention has also been given to the location as conveniently as possible of the little speaking tube or telephone that communicates outside to the chauffeur, and the thought has been to make it unnecessary for the car's occupants to have to reach for it.

# Sociability Recognized In New Bodies *at the Show*

**A**LTHOUGH the type of roadster with room for more than two has existed with a few companies previous to this year, it has remained for the New York show to bring out a great many bodies that are variously known by such names as the Cloverleaf, Sociable, Chummy roadster, etc. It is surprising how much room has been given such close-coupled bodies, some of them having comfortable seating accommodations for four, while other provide for three. The idea is to bring all of the passengers as close together as possible without crowding, and it is done by making an aisle between the individual front seats to another seat somewhat back of these, but close enough for all to be able to converse easily.

A number of these bodies were shown in Motor Age last week, but the show has brought the list to about twenty. Several of the new ones are shown in plan, and indicate the trend in this direction. From these sketches it is evident that there are a variety of shapes and forms which this new body can take, and the design bids fair to become a fixture in body types, for it not only gives a shorter car which is lighter than the regular touring form, but affords the extra seating so often desired without sacrificing the snappy lines that a well-proportioned and designed roadster always has.

The aisle width between the two for-



Seating arrangement of the Peerless roadster

ward seats of necessity is limited, but this is in every case sufficient to make it easy to slip into the rear seat. Chandler has appeared with one for four passengers that is scarcely longer than the conventional roadster. The double-cowl effect also is carried out at the back of the forward seats, and a deck merges into the cowl pieces running back outside of the back seat. In it there are compartments on either side of the seat in which there is space for the stowing of many small articles. In most cases, however, where the rear seat is intended for two, the extra space that would be taken by such little compartments is given to the seat width, but Chandler and several others seem to have enough width for two in addition to these cabinets. On the new Marmon four-passenger roadster, the rear seat is divided

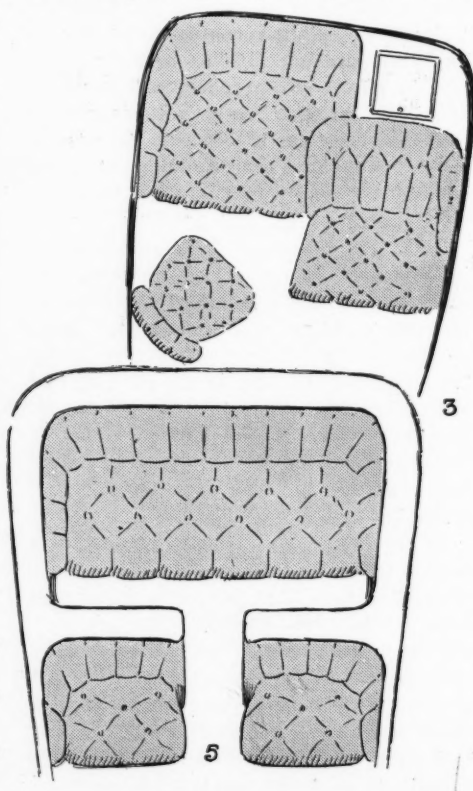
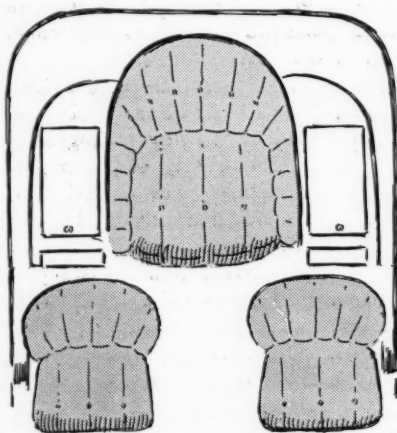
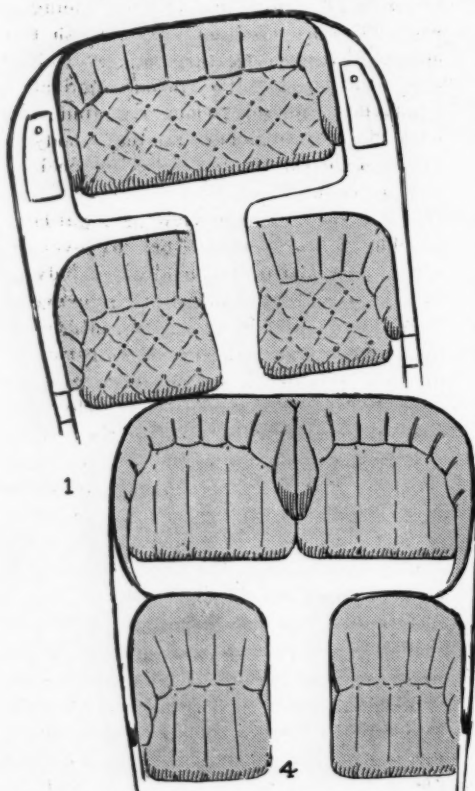
into individual chairs by a center bulge in the upholstery. A Cunningham chassis carries such a type, it being of the design in which the front seat back cowls merge with the deck. Others showing this new roadster for four are Cole, Pullman, McFarlan and Auburn.

Among the three-passenger designs, the seat is usually rounded so as to have exceedingly comfortable armchair possibilities. Where only one seat is provided, the rest of the body width often is given over to the luggage compartments and a wide deck, as in such designs as the National, Peerless, Lexington, Davis, Haynes, Premier, Crow-Elkhart and Lescina.

Then there is the type of three-passenger design in which the main seat for two passengers is somewhat back of the driver's seat. In this class may be put Studebaker, Mitchell, Winton, and a number of others.

Not all the good seating arrangements can be credited to the new type of roadster class, however. The divided-front-seat form of touring car is much liked at the show, and a number offer such designs.

Realizing that the owner of a coupe often wishes to carry more than the usual three, Kissel has an extra front seat of the revolving chair type in its coupe. The driver's seat is ahead of the main seat for two, so that there is plenty of room for the extra chair opposite the driver. Another pleasing body at the show is the



1—The Chandler four-passenger arrangement

2—The Lexington three-passenger seating arrangement

3—How the Kissel coupe cares for its passengers

4—The layout of the four-passenger Marmon

5—Cunningham's four-passenger plan of seating

Cunningham four-passenger touring car that has divided front and rear seats, each being almost an armchair in itself. This, combined with the double cowl, makes a very attractive body. Unusual seating is

provided in the five-passenger Allen touring car whereby the seat backs are curved both front and rear with the idea of making them more comfortable and roomier at the same time.

The Scripps-Booth staggered seating is unchanged from last season, and differs in that the main seats are for two, with an auxiliary seat ahead of the passenger seat and opposite the driver.

## Stowing the Tools

**M**ETHODS of stowing away the tools conveniently have been given attention in many of the cars. While this is a feature that has been adopted widely, previous to this year, realization of the fact that it is desirable not to have to disturb the seats to get the tools seems more pronounced at this show. The running board aprons are a favorite place with many car makers, and give plenty of room for everything from jack and tire pump to tire chains and wrenches. Utilization of such otherwise-wasted space seems quite logical, as it affords a most easily reached location without in any way detracting from the smooth exterior so desirable these days.

### Space in Doors Used

In other cases the space in the doors is made use of handily as Packard and Scripps-Booth have been doing. Special shaped-out places for each wrench and tool is provided, with a flap going over the entire space and neatly concealing the whole outfit make a most handy feature when small adjustments and repairs must be undertaken. This location, however, does not take care of the larger tools such as jack and tire pump.

Another good place for small tools seems to be in the space back of the front seats. Now that the double cowl is with us, a slightly deeper back is used, and this at once lends itself to such compartments, not only for tools, but for other small articles as well. Some makes have utilized the waste space back of the front cowl for tool boxes and the like, and this is also a very easy place to get at. An advantage of all such places of tool concealment over that of the doors seems to be that wood or metal covers can be fitted, and these provided with locks, although it doubtless would be very possible to fit locks to the door tool kits.

Tool boxes and similar compartments are especially noticeable on the new type of staggered seat roadsters, the design affording plenty of opportunity for providing them.

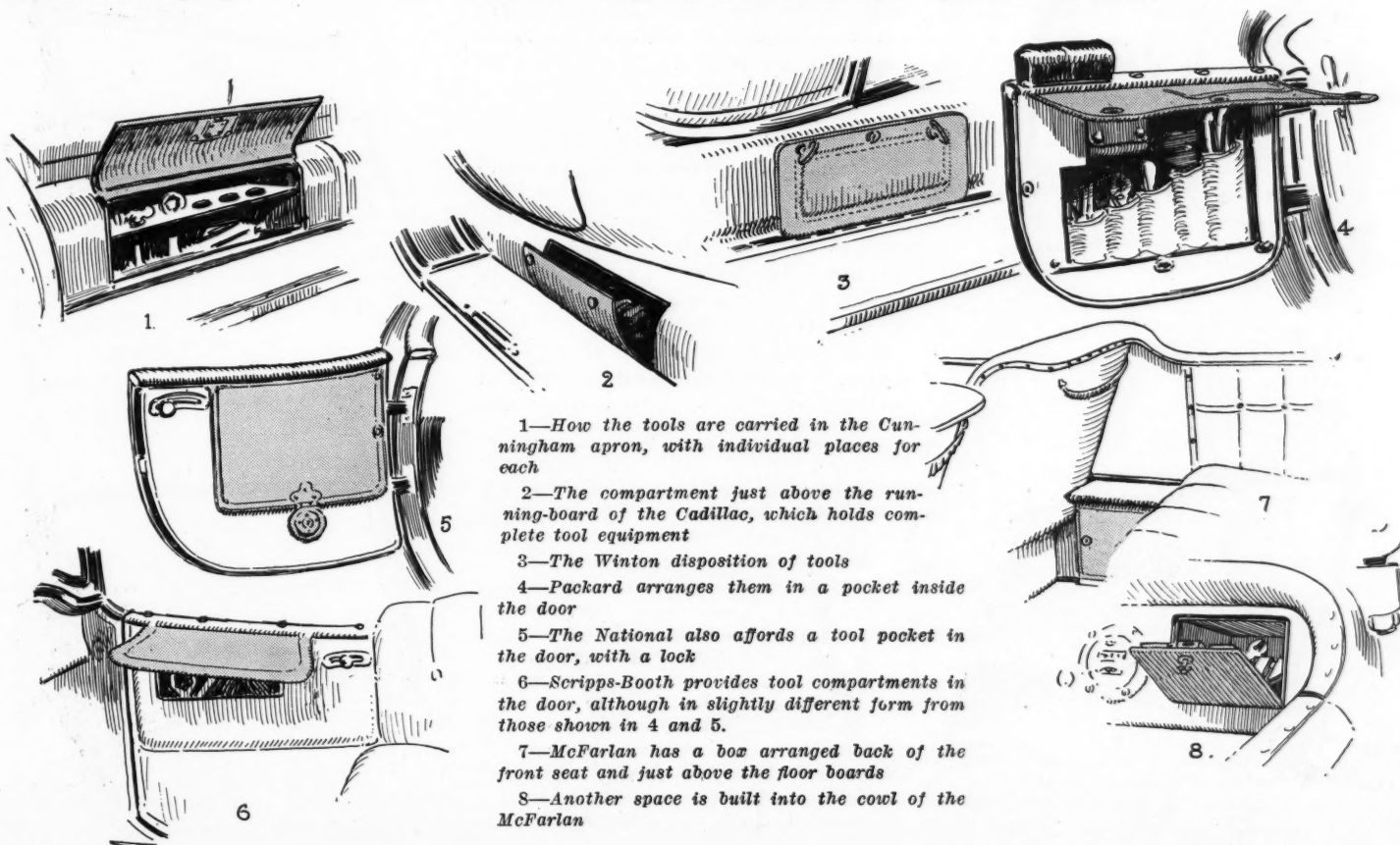
The day has passed when the car operator must rummage through a heterogeneous mass of whatnot to find some particular tool for making minor repairs. It would seem that the coming motorist is to be lifted out of the slovenly class and into one of orderly arrangement. Some of the tool compartments are so arranged

that the different tools just fit in their respective places so that placing them in the wrong sections is out of the question.

The new arrangements will make for greater care in the handling of tools and enable the operator to keep a better watch on his kit than has been the case heretofore when everything was thrown into the compartments beneath the seats, to say nothing of the convenience to the other passengers in the car when a roadside repair is necessary.

### NEW STARTER COMPANY FORMED

New York, Jan. 4—Special telegram—The A. B. C. Starter Co. has been incorporated in Michigan with a capital of \$150,000 by Chas. P. Sieder, Alexander Churchward and B. S. Colburn. Mr. Sieder is president and general manager; Mr. Churchward, vice-president and chief engineer; and Mr. Colburn, secretary and treasurer. The company will manufacture a lighting and starting system adaptable to Ford cars. The system is of Mr. Churchward's design and has independent units for starting and lighting. The entire outfit will weigh less than 100 pounds it is claimed.



1—How the tools are carried in the Cunningham apron, with individual places for each

2—The compartment just above the running-board of the Cadillac, which holds complete tool equipment

3—The Winton disposition of tools

4—Packard arranges them in a pocket inside the door

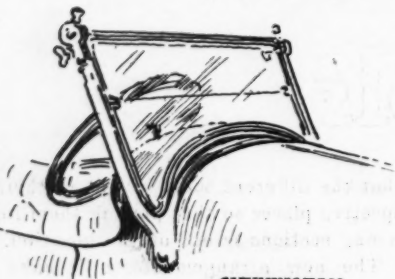
5—The National also affords a tool pocket in the door, with a lock

6—Scripps-Booth provides tool compartments in the door, although in slightly different form from those shown in 4 and 5.

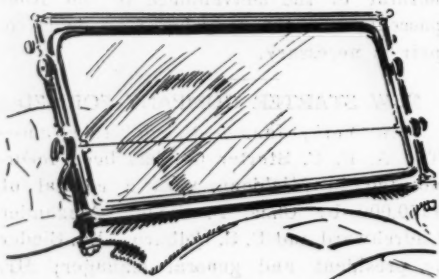
7—McFarlan has a box arranged back of the front seat and just above the floor boards

8—Another space is built into the cowl of the McFarlan

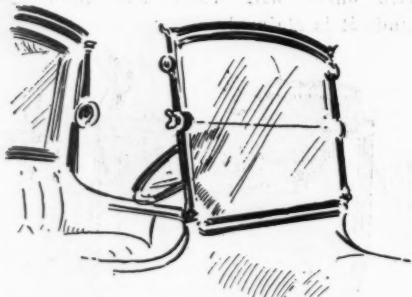
# Windshields Cut On The Bias



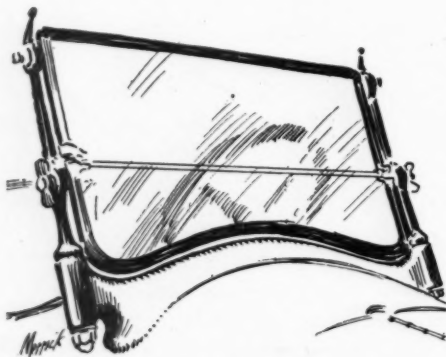
CUNNINGHAM



OWEN MAGNETIC



S-G-V



MERCER

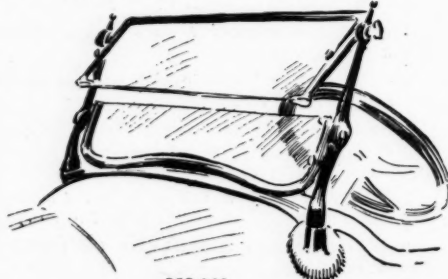
THE New York show should be thanked for calling the attention of the general public to one feature which has developed within the last year, but which existed heretofore only in scattered examples. This is the rearwardly tilted windshield, a feature which took the bringing together of these scattered units at the first exhibition of the new year really to impress visitors with the prevalence of an idea not new to America. The idea of the tilted windshield is not of such recent growth as might be imagined from the above, for there have been several isolated examples during the past, but the sloping hood, the straight smooth sides, together with the speed impressions that they give, have given the windshield a tilt to make it conform with the impressions of velocity generated by the majority of the other body lines.

## Nearly Dozen Examples

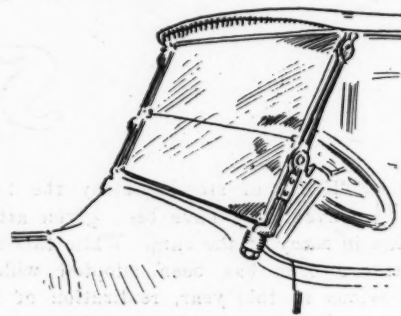
There are ten or a dozen examples of slanting shields at the Gotham exhibition. The chief objections which have been heard against the idea are first, that unless particular care is taken to obtain the proper angle, the driver is likely to be in danger of being dazzled at times by reflections from the glass or to be misled, or at least, troubled, by reflections of objects on the road.

This argument is not considered a valid one where the proper pains are taken to eliminate such reflections. The constructional difficulties have been solved and numerous methods of mounting the shield have been evolved. There was very little rearrangement required at the top of the shield for its connection to the one-man top or to the permanent top as the case might be. It became only necessary when the windshield supports were made slanting instead of straight that the ball-and-socket-type of joint at either side of the upper portion of the standards be slanted in the opposite direction to take the sockets in the top.

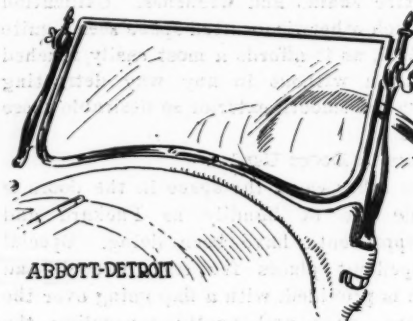
If one may be allowed to attempt prediction, it appears that another season of development will find a large percentage of the cars using the slanting windshield. There are sufficient in line now to demonstrate the merit of such a departure and if it is found advantageous the idea should become very popular in a short time.



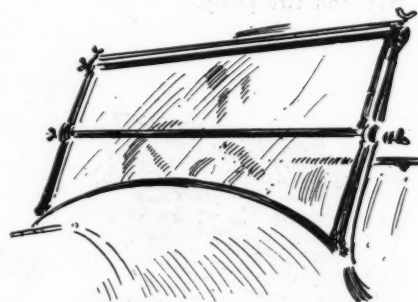
MOON



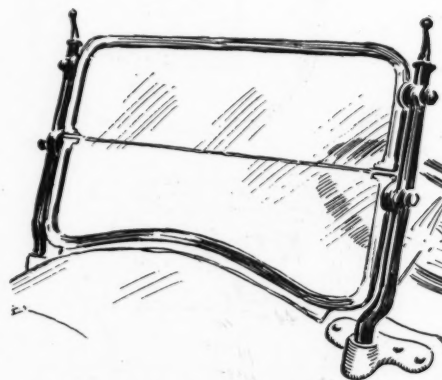
OLDSMOBILE



ABBOTT-DETROIT

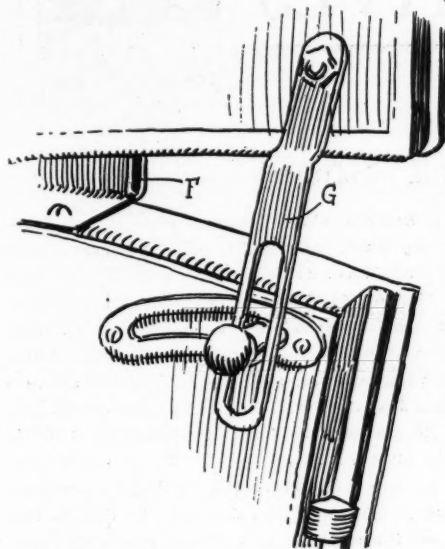


FIAT

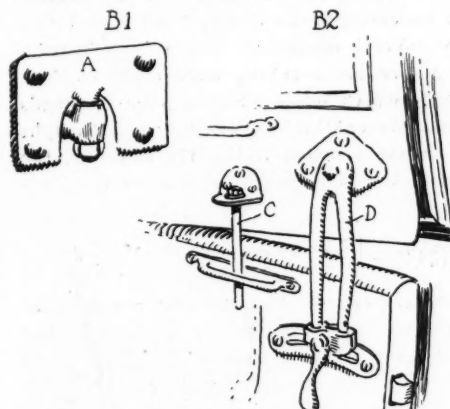


BRISCOE

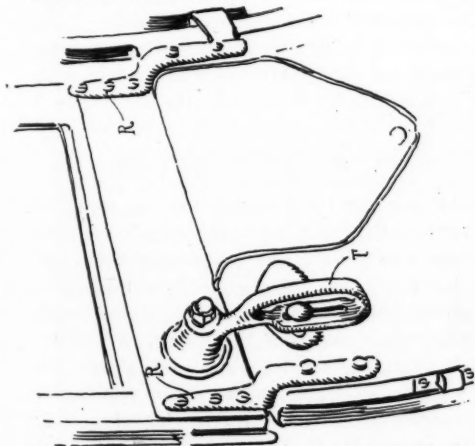
# Mechanics of the Detachable Tops



Simple Pullman door mechanism. Lever G pulls the regular door handle over to unlatch the door and it is slotted to permit of up-and-down movement of the two doors. Plate F slides into a slot in the upper door and acts as a support



Briscoe—B-1. Detail of attachment of plate A of detachable top to body supporting iron or regular open top. B-2. How provision is made for up and down movement of top and body doors on Briscoe. Lever D slides in lower door handle and C in its socket on the lower door. D, worked from outside, moves the door handle back and forth



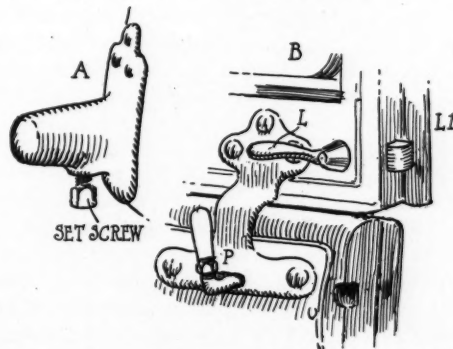
Hupmobile top door fastening by irons R. The handle is operated from the outside by lever T, which also forms a grip for pulling over the regular handle from inside

THERE are almost as many different ideas incorporated in the details of construction and attachment of the popular detachable tops as there are makers supplying them and the style set by Kissel a year ago is gaining every month. Differences in shape of bodies, width and hanging of doors, and other body constructional points really have made the proper fitting of a detachable top a special problem for each car maker, although there are some types nearly alike. The car manufacturer in each case seems to have designed a top both in appearance and in utility value that is ingenious and so nearly permanent when in position that one need have no thought for it from the day it is put on until he gets ready to take it off.

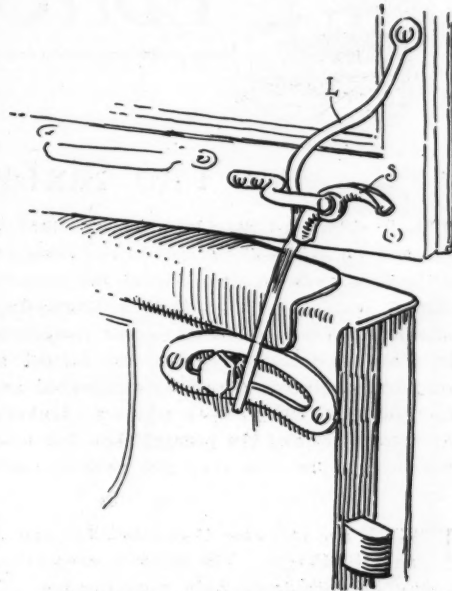
The tops range from the very elaborate type that is scarcely distinguishable from a limousine to the less beautiful, but none the less useful type, that is not so integral a part of the car. That is, some of them are of wood construction with regular glass windows and fit so well that the car becomes at once a sedan to all intents and purposes, whereas others are of stiff cloth material and make no attempt to disguise the fact that they are not in the least a permanent part of the vehicle. The latter have the special advantage of lightness.

In nearly every case, advantage is taken of the top irons that are ordinarily used to hold the folding open top of the car, and some form of bolting or clamping arrangement is designed to fit these supports. Some, however, are arranged to bolt through the top sills of the body, thus making a somewhat better looking job.

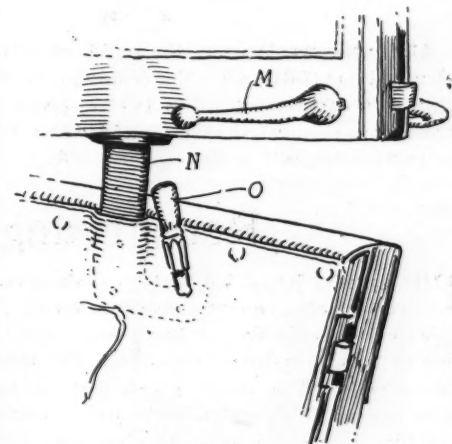
Another problem is the method of opening the car doors from the outside, most of the cars of today having the inside door handles that complicate matters for the detachable top. Generally some form of lever worked by an outside handle on the door part of the top engages the inside handle proper and pushes it over just as it would be done from within. This type utilizes the door's regular latch.



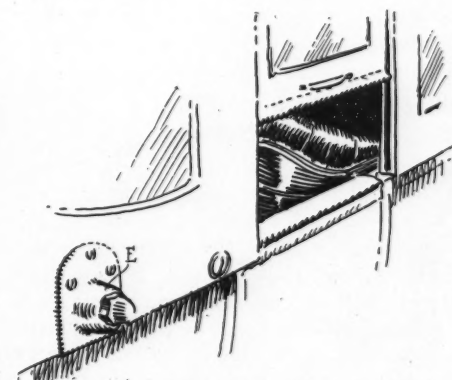
Details of the Saxon detachable top. At A is shown the piece going over the open top iron. Detail B indicates how the main door latch is held inoperative by plates P that serves also as an attachment for the two doors. Lever L works the auxiliary lever L1 from inside the car



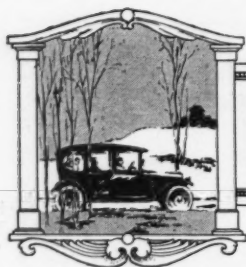
How the cam S, moved by handle outside pushes lever L over, and this in turn moves the regular door handle. This construction is employed by Empire and Marion



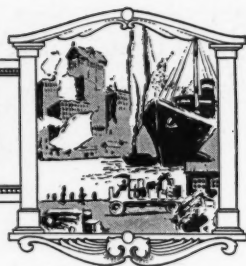
The Westcott auxiliary door carries the latch and the main door latch is held out of engagement by an extension of plate N under the upholstery. It engages the main handle O. The auxiliary handle M works the temporary latch from within



Sliding door curtains of the Maxwell detachable top to permit entrance to and exist from the car. This view also shows in detail at E the method of attaching to the regular top iron



## EDITORIAL PERSPECTIVES



### The Sixteenth Annual New York Show

THIS show justifies the argument that for years yet there will be sufficient variety in car design to feed the interest of the thousands who worship at the shrine of motordom. The ultimate car is so far off that attempting to imagine it is ridiculous. Three years ago some imagined the end, imagined the standardization of cars, and almost saw the day when designing engineers would be eliminated and the car made by some universal design upon which all makers had agreed. That day is not here and the present show has more new designs than seen in any previous show for several years.

THERE are two cars that stand for new design, the Marmon and the Fergus. The latter is revolutionary, in a few years it may be considered only evolutionary. The Marmon marks the debut of greater use of aluminum, even in cylinder castings. Franklin is evolutionary in its wider use of aluminum. There are other new cars incorporating quite new ideas, that may mark them as evolutionary.

LAST year we thought the eight revolutionary, today it is merely evolutionary—the V-design of motor having taken a place in engineering. The twelve, prophesied a year ago, is here today, stronger than the eight was a year ago. The eight has grown amazingly in the year, however.

### Recognizing the Needs of the Owner-Driver

THE present New York motor car show recognizes the owner-driver more than any previous show. The 1916 car is an easier car to care for, it has more individual comforts, it is more of an owner-driver's product. For the first time we have the car without a single grease cup to fill, to loosen or to screw down. No longer will the owner occasionally have to go over two score grease cups, turning some down every 100 miles, screwing others down every 300 miles, others every 500 and some every 1,000. It used to be considered the acme of design to fit a grease cup in every place where lubrication was needed and wear was certain. That regime is passing, the thin wedge of the self-lubricating car is entered. One maker, the Fergus car from Ireland, has actually accomplished this and the car has run and demonstrated its feasibility. With several American builders, there is a very general movement to reduce the number of grease cups. There is one car with but two grease cups, another with but four and many with relatively few as compared with last year.

A SECOND step in the work of simplifying the car for the owner-driver is that of protecting parts from dust. This is assuming the form of a movement to enclose parts that have generally been left exposed. This enclosing program started several years ago and is now moving on in a slow but certain direction. Several years ago we started enclosing the wires to the spark plugs, finding it better to carry them in a conduit than leaving them straggling around the cylinders where they fell victims to grease, water, and hot cylinders. Today, we accept as standard practise the adequate enclosing of high-tension wires.

THE show is still a sombre show, one essentially of dark colored open touring cars, of sombre colored cloverleaf roadsters with tops up; of convertible winter body types and with a sprinkling of the white bride's car, the impractical limousine with its super-parlor tapestries, with its silk ribbons keeping you out of it and with its draperies only for show. Black and dark greens predominate, and the looked-for advent of more color in standard bodies is not yet. Brilliant colors are the sparse exception. Some makers have a space filled with black cars, not a single spot of color relief. It is a scarcely good merchandising. All are not interested in black, particularly around the new year. The lack of color may be due to the European war, however, as the scarcity of pigment resulting from that conflict is tending to make us a drab nation.

THE accessory division does not bubble over with innovations, nevertheless there are scores of improvements. Ignition makers have met the needs of the eight and the twelve. The cord tire is much in evidence as is the black tread tire now being featured by several concerns. There is a healthy change in a few accessory concerns taking more pride in their exhibits and making them worth while. Stewart-Warner leads in this, with a commendable exhibit, an exhibit well thought out. If more accessory makers would follow the example, the upper floors of the palace show will be far more attractive.

A GAIN: Only a few years ago we had the first examples of enclosing valve springs and tappets on T and L-head motors. Today we look in wonder at cars where these parts remain exposed. Today it is recognized design to enclose every part of the valve mechanism when valves are placed in the cylinder heads.

GO FURTHER: For years we kept the engine lubricator outside until some one decided to place it within the crankcase. True, putting it within the crankcase made it less accessible, but the oil pump was then reliable enough to be boxed up. It did not need adjustment every other day. It is better in the crankcase where it is kept at a better temperature, where there are no external oil pipes to vibrate loose and leak and where everything is simplified. Today we stare if the oil pump is external.

AND to progress: Why can we not entirely enclose some of the other parts that are now adequately reliable to be kept out of sight. There is scarcely any need why the components grouped around a motor should stick out as the quills of a porcupine. Close them up, protect them from water, mud, oil and improve the general appearance of the motor. Weather-proofing can be carried much further, perhaps in 5 years the exterior of the motor will be as clean as that of a watch; in fact, the Fergus car practically measures up to this standard. In motor car construction we are tending toward refinements, and at this year's show there are indications that these refinements shall be useful as well as ornamental.

# Brakes Not Applied During 1915 by Motor Industry

Statistics Show that American Makers Traveled Prosperity Route with Throttle Wide Open

LIKE the seventh daughter of a seventh daughter, Alfred Reeves, general manager of the National Automobile Chamber of Commerce, is endowed with the gift of prophecy. For a crystal globe, the proverbial aid of the seers, he has substituted several volumes of trade records, through which he has peered and from which he has made many interesting deductions. Not only has he looked into the future, but he has pierced the veil of the past and the resultant statistics are a poignant commentary on the prosperity of the motor car industry and a promise of even greater prosperity during the coming 12 months.

## Record Car Output for 1916

Reeves' prophecy for 1916 is that the production of cars will exceed 1,200,000, a world's record, and an increase of 308,000 over the 1915 output. Even this great supply will not satisfy the heavy demand that he prophesies, as he figures that there is a market for 5,000,000 cars provided every person with an income of \$1,200 or more has a desire to join the ranks of the gasoline buyers.

According to Reeves' statistics, 892,618 motor vehicles, the retail value of which was \$691,778,950, were sold during the year just past. The passenger cars sold totaled 842,249 and their purchasers spent \$565,856,450 for them. The 1915 output of motor trucks was 50,369, bringing in the

retail market the sum of \$125,922,500.

This phenomenal increase in the sale of American motor vehicles was partially due to the growth of our export trade, an increase of 250 per cent over 1914. During 1915 we have shipped cars to eighty different countries. The value of these exports exceeds \$100,000,000, as compared to \$28,507,464 in 1914. Reeves estimates the value of 1915 motor truck exports, which showed an increase of 600 per cent over the shipments of last year, at \$63,000,000, and that of 1915 passenger car shipments, which increased 90 per cent, at \$37,000,000. John Bull was Uncle Sam's best customer, spending \$21,000,000 for 8,321 passenger cars and 5,306 commercial vehicles during the fiscal year ending June 30, 1915.

The 892,618 motor vehicles sold during 1915 came from the factories of 448 manufacturers, 257 of which are builders of trucks. Thirty-four of the forty-five states can boast of having a hand in this enormous production as only nine commonwealths have no motor car plants. To realize the advances made by the industry, one only has to look back to 1899, when 3,700 cars, valued at \$4,750,000, were produced and to 1903, when the output was 11,000 machines and the value \$12,650,000. Quantity production started in 1910, when the companies standardized the most important parts of their product and turned

out 187,000 cars. The 5-year period following the 1910 renaissance resulted in the keenest kind of competition, a survival of the fittest fight that swept more than 400 companies into the bankruptcy courts during the half decade of record-breaking advancement.

## 1915 Licenses Total 2,400,000

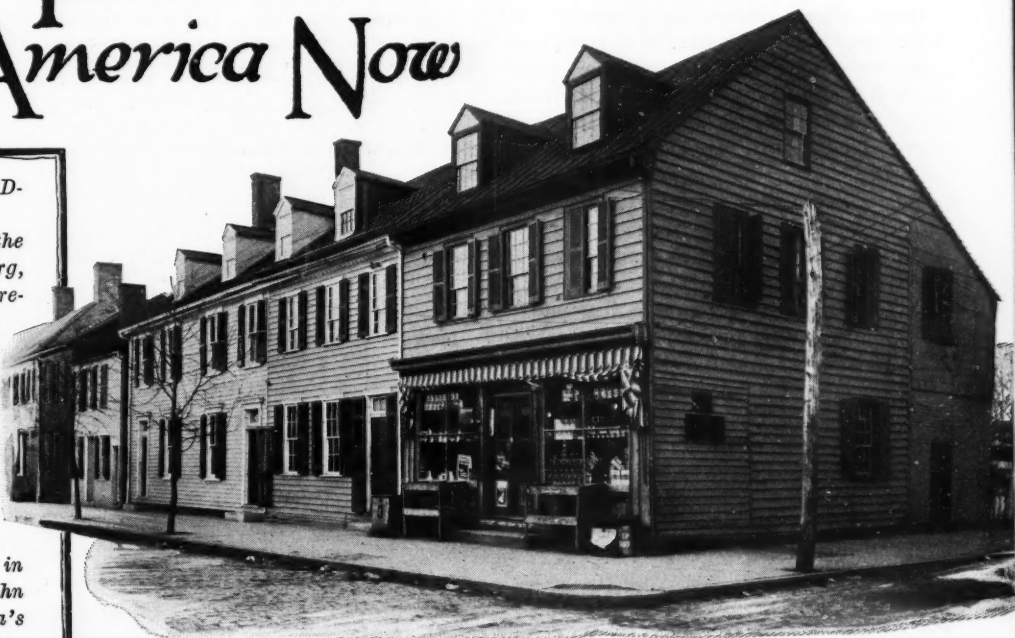
The N. A. C. C. statistician estimates that the total registrations for 1915 were 2,400,000, a figure based on the state reports of July 1 when the license venders announced that 2,070,000 tags had been sold to date. These cars travel 12,000,000,000 miles a year, according to Reeves, and consume 980,000,000 gallons of gasoline and 28,800 gallons of lubricating oil annually. The owners of this staggering flotilla buy 12,000,000 tires, of which there are 125 different brands and 140 types and sizes. To serve this army of motorists, there are 27,700 dealers, garages, repair shops and supply stores. During the past year, motorists have turned into the strong-boxes of the states \$14,000,000 for registration fees, personal property and wheel taxes and drivers' licenses.

One out of every forty-eight inhabitants of the United States now owns a motor car, Reeves finds after performing some long division stunts with his versatile pencil, and if each motorist were allotted a special territory for his exclusive use, he would have 1 mile of public road on which to tour and his domain would measure from 1 to 1½ square miles.

# See America First — • • • See America Now

## JOHN PAUL JONES HOUSE AT FREDRICKSBURG, VA.

AT one of the street intersections of the residential district of Fredricksburg, Va., stands a grocery store. In many respects, it does not differ from thousands of other corner markets. Children stand for 5 minutes before the candy counter before deciding on a penny purchase and housewives, wearing aprons and with sleeves rolled up, storm the doors to buy forgotten articles for dinner at the fifty-ninth second. It is different from any other grocery, however, in that it is one of the few landmarks in the country associated with the life of John Paul Jones, for it was here that America's first naval hero, the Revolutionary commander who shouted to the English "I have just begun to fight," lived.



EDITOR'S NOTE—This is the sixtieth of a series of illustrations and thumb nail sketches of scenic and historic wonders of America to be published in Motor Age with a view of pointing out to motorists the picturesque points of interest in their own country

# Huff Elected President of S. A. E. at Winter Meeting

## Military Preparedness One of Most Important Topics to Be Discussed by Motor Car Engineers

NEW YORK, Jan. 5—Special telegram—Russell Huff, chief engineer of Dodge Bros., today was elected president of the Society of Automobile Engineers, succeeding President W. H. Vandervoort, of the Moline company.

Members of the S. A. E. have a strenuous program for the annual winter meeting. The Standards committee completed its last quarterly session of the year yesterday and the first session of the general meeting was called this morning. This was strictly a business session, the chief subject of interest was the election of officers.

Wednesday afternoon and evening is devoted to informal gatherings of members and their wives. There is a luncheon for the women and a visit to points of interest in the city for the afternoon with a dinner and theater party for the evening.

Thursday is set for the professional sessions which will be opened by the addresses of the president and president-elect, followed by engineering papers. The closing feature of the annual winter meeting is the dinner Thursday evening at the Plaza. Daniels and Wood to Speak

The part of the motor car engineer in our country's defensive system is to be the subject of the evening and the members of the society will listen to its discussion by Josephus Daniels, secretary of the navy, Major-General Leonard Wood, U. S. A., commander of the department of the east, and Alfred Reeves, general manager National Automobile Chamber of Commerce.

Other officers elected today are as follows: Eugene S. Foljambe, first vice-president; Robert H. Combs, second vice-president; Herbert Chase, treasurer; Edwin R. Hall, David Beecroft, John G. Utz and George W. Dunham, members of council.

During the day the engineers will take part in a battle of the battery versus magneto ignition question. Francis R. Hoyt will state the case for the magneto and will cite data to prove that careful block tests show a very considerable horsepower loss upon substituting battery for magneto.

Frank Conrad, of Westinghouse, will take the floor for the other side and will give his reasons for thinking that battery ignition now is as good as magneto, and Alexander Churchward, of Gray & Davis will give some highly scientific information relating to the electrical nature of sparks of all sorts.

The arguments in the papers prepared for presentation may be summed up as flatly contradictory. The magneto camp holds that the ignition given by a magneto is more effective at high motor speeds because the spark is hotter as the speed is greater; that it is an advantage to have a



RUSSELL HUFF, NEW PRESIDENT OF THE S. A. E. FOR 1916

RUSSELL HUFF, president-elect of the Society of Automobile Engineers, is chief engineer of Dodge Bros., which position he assumed November 1, 1915. Previous to that date, President Huff was connected with the engineering department of the Packard Motor Car Co. for over 15 years. It was on June 25, 1900, that he associated himself with the Packard organization in the drafting department. In 1905 he became chief engineer of the Packard organization. In 1907 he joined the Society of Automobile Engineers and since that time has been one of the active members, both in general policy work and also in committee work. He was vice-president in 1913. Previous to his active connection with the S. A. E. work, President Huff was lending his best efforts to the mechanical department of the Association of Licensed Automobile Manufacturers, which maintained an experimental and testing laboratory at Hartford, Conn. Much engineering development was carried on by this organization and was later handed over to the S. A. E. and greatly assisted in its early standardization work. President Huff has several thoughts in mind for his terms as president, one being increasing the membership very materially; another is the encouragement of an engineering digest of American and foreign literature, and the third is devoting more attention to the finances of the society.

big discharge of electricity between the spark plug points.

The battery supporters hold the view that a spark is a spark, that its purpose simply is that of starting the gas explosion and provided it is hot enough to do this, there is nothing gained by making it hotter or causing it to last longer.

Mr. Hoyt has prepared the longest of the three papers, and he gives a summary at the end which may be quoted.

"For the best results, the spark in an engine cylinder must occur at a time de-

pending on the speed with which the gas can burn. Spark advance, while necessary, is often, though inefficiently, used as a substitute for spark heat. The unavoidable errors nearly always present in spark timing can be compensated for to a great extent by increasing the spark heat.

"The open-circuit battery system relies entirely on spark advance for meeting varying engine conditions. In the closed circuit battery system, the spark grows weaker as the speed increases—which is wrong.

"The larger the spark the faster the flame spread and greater the efficiency.

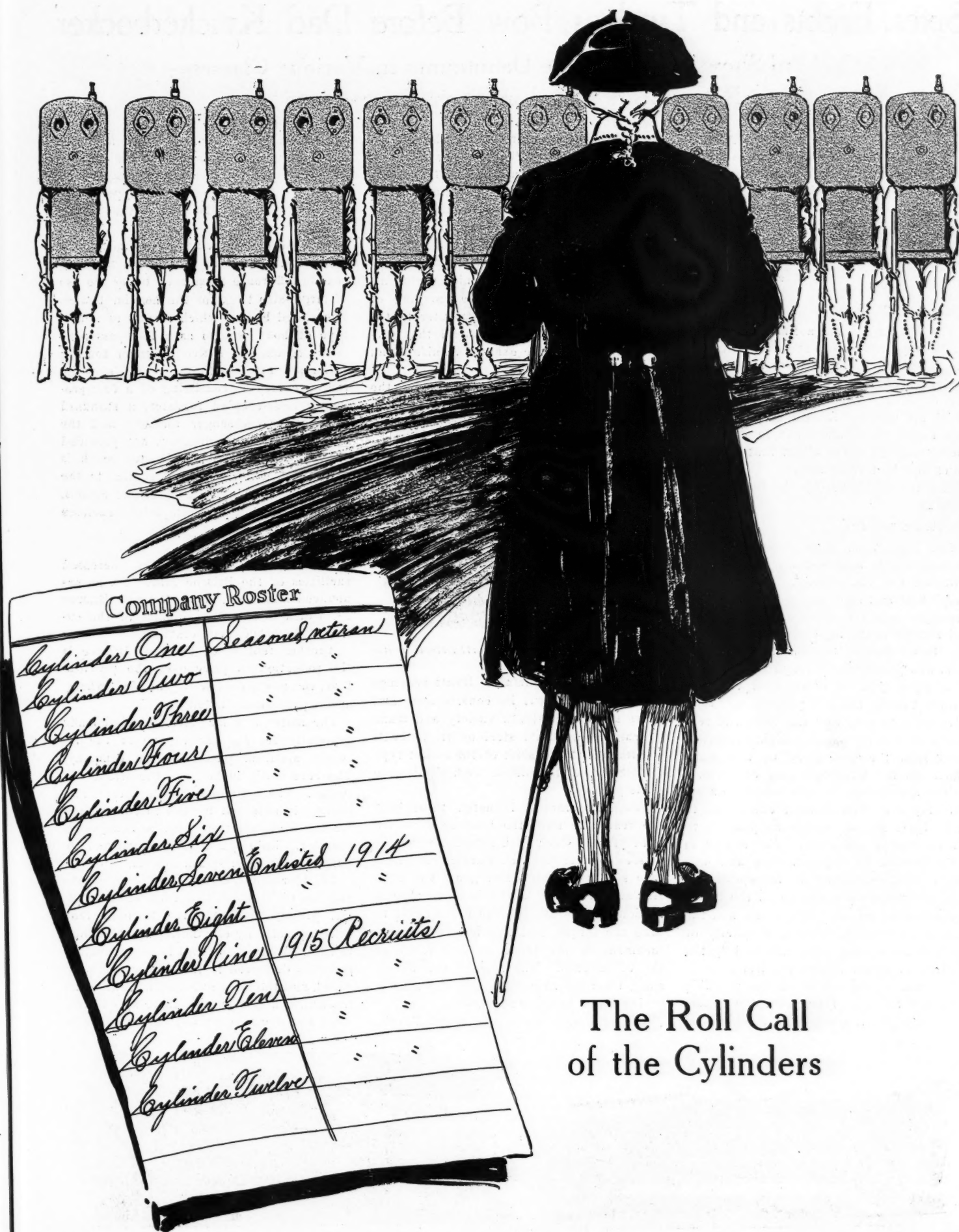
"A prolonged spark is necessary for advanced positions owing to vapor variations in the cylinder.

"The magneto spark, increasing in intensity with the speed is directly suitable to the requirements of an engine."

Such statements cannot go unanswered, but neither Mr. Conrad nor Mr. Churchward have made positive statements in their papers which can be used as answers to the accusations made by Mr. Hoyt. Both have tackled the subject from somewhat different angles. The former author states positively that the long enduring spark has no value, because directly the small body of gas surrounding the spark-plug points has been burnt, any continuance of sparking can have no effect upon the rest of the gas in the charge. He states also that a shortcoming of the magneto is that the voltage of the spark is limited, whereas the battery spark can be of any voltage desired.

### Decides on Proper Headlights

The Standard's committee of the S. A. E. in session yesterday recommended the requirements for headlights on motor cars, the recommendation being in the movement to reduce danger because of glaring headlights. The requirements of the headlights, according to the resolution, are that they must be of sufficient light to reveal all persons, vehicles or other objects on the road way for a distance of 150 feet. Ahead of the vehicle, the headlights shall be arranged so that no portion of the reflected beam of light, when measured 75 feet or more ahead of the car, shall be more than 42 inches above the road surface. Further, each headlight must also give sufficient side illumination to the right and left of the car to indicate any person, vehicle or substantial object 10 feet to the side of the motor vehicle at a point 10 feet in advance of the vehicle. It is claimed that this recommendation will cover headlights that will not dazzle other vehicles on the highway and yet give sufficient light for safety in driving.



The Roll Call  
of the Cylinders

# Sixes, Eights and Twelves Bow Before Dad Knickerbocker

Gotham Show Reveals Some Debutaunts in Various Classes—  
Refinements Noted in Their Companions

WHILE there are no actual surprises to speak of at the show, there is a great variety of new models which are on exhibition for the first time.

In twelves there is the Haynes and also the H. A. L. Eights produce the Peerless, the Cunningham and the Scripps-Booth. Sixes are headed by the Hudson, the details of which were kept entirely hidden until the show opening. There is a new Paige six described last week.

The Sun six also has not made a previous public appearance, and the same is true of the Lescina. In fours there are the new model Briscoe, the Sterling, a Lescina, and the S. J. R. There are several others which are modified models, as instance the new series Studebaker, but in each case the alterations are so slight that the chassis cannot be termed new.

The Hudson Super-Six is described on page 22.

## Abbott-Detroit Six

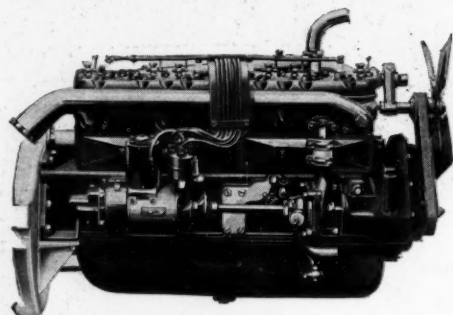
The New York show revealed a new Abbott-Detroit model—made by the Consolidated Car Co., Detroit. This is called model 6-44 and as a touring car of seven-passenger capacity, sells for \$1,195. A special feature is the lightness of the chassis, this being gained through the materials used, and principally through the adoption of a light type of drive with the rear springs taking the car propulsion. It is interesting to note that this design of rear springs and drive requires eighty-four less parts than the last model of this make which did not have this type of drive.

Unit assemblage of the motor, gearset and clutch is well worked out so as to be compact and as simple as possible to aid in weight reduction. The engine is a Continental of 3¼-inch bore and 4½-inch stroke, delivering 40 horsepower at 1,500 revolutions per minute on the block. The cylinders are cast in a block, and the head is detachable, external simplicity of the cylinder casting being attained by the elimination of an intake manifold.

Electrically, the car is all Remy. This is of the two-unit type, with the generator and ignition distributor combination

on the right and driven off the end of the pump shaft. The starting motor is located on the left and its shaft housing connects directly to the housing of the flywheel, making a substantial and neat installation with no moving parts exposed. The generator is self-contained, and carries on its frame the regulator, the coil and the distributor, and a nice wiring arrangement results from the carrying of the terminals from the distributor to the spark plugs over a fibre shield that protects them from the exhaust manifold and assures good support.

Simplicity has been the aim in the clutch assembly, the clutch itself being made up of three disks of large diameter



Right-side view of 1916 Abbott-Detroit motor

and wide friction surface. Hyatt bearings are used throughout its construction, and gears are of stub-tooth variety and made of chrome-vanadium steel of triple heat-treatment. A gearshift of the socket type is fitted, as distinguished from the H-gate variety.

Standard practice is noted throughout the rear axle unit, the housing of which is of pressed steel, with external webbs or trusses to strengthen it. Chrome-vanadium axle shafts are used and gears are of a similar material. There is a triangular torsion arm paralleling the drive shaft to take the torque, and this has its rear attachment to the front housing cover of the differential. The springs are underslung from the axle tubes and this aids in giving a low hanging to the car.

The rear axle gears are spiral bevels,

and on the right are carried by a Bower roller bearing, whereas the left side is held up by an annular ball bearing which is of the 90 per cent thrust type. Two sets of bearings also carry the pinion shaft.

There are five body types built upon the one wheelbase of 122 inches, the only chassis difference occasioned being the use of larger-size tires for the heavier bodies. The closed bodies, which consist of a new type of body, known as a four-passenger motor coach, and a five-passenger touring sedan are fitted with 33 by 4½'s, while the open models, consisting of a four-passenger close-coupled roadster, a standard form of two-passenger roadster and the seven-passenger touring car, are provided with 32 by 4 tires. The motor coach is fitted with a top somewhat similar to the type fitted to the popular cabriolet models, so that, when up, it completely encloses the car.

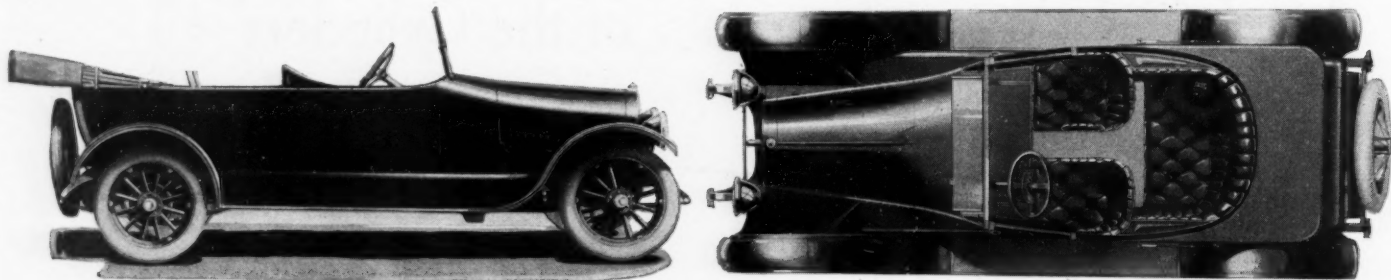
## New Briscoe Four

Following closely upon the increased facilities of the Briscoe Motor Co. as announced last week, comes the new Briscoe 24, which is the first product of the enlarged \$6,000,000 corporations.

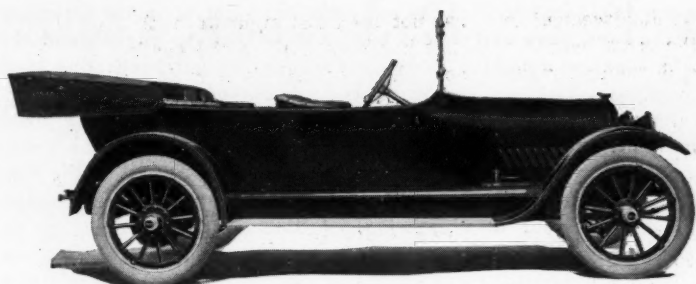
Another feature of the new Briscoe is the reduction in price over the previous four, the new model selling at \$585, whereas its predecessor listed at \$750.

The motor is a long-stroke design made especially for the car in one of the recently acquired plants of the company. The bore is 3½ inches, and the stroke 5½ inches. The cylinders are block cast, and cooling is obtained by the thermo-syphon system in connection with a honeycomb radiator. Lubrication is accomplished by the constant level splash system.

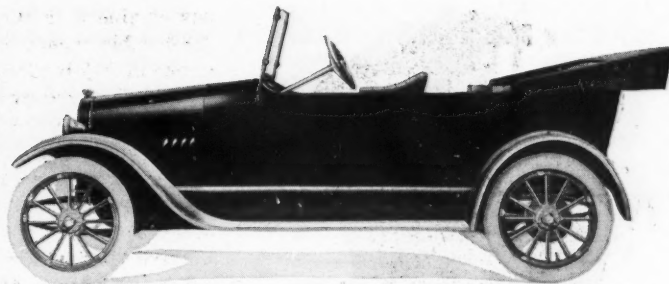
The rear axle is of the floating type with gearless differential, this form of differential giving positive drive to both rear wheels practically eliminating the tendency to skid. When one wheel loosens, traction power is delivered to the solidly grounded wheel, and the loose one does not skid. The transmission is selective, three speeds forward and one reverse. Left drive and cen-



New Abbott-Detroit seven-passenger touring car and seating arrangement of the four-passenger roadster



The new Auburn touring car just announced



New Briscoe four, five-passenger touring

ter control is found in the new car the same as in previous models. There are two sets of brakes, one internal expanding and the other external contracting.

A two-unit system of starting and lighting is used. Regular equipment consists of a one-man waterproof top, rain-vision, clear-vision windshield, electric horn and tools. Tires are 30 by 3½ all around with demountable rims.

The car will be made in five-passenger touring car and two-passenger roadster models. This addition giving the Briscoe a triple line, the 4-38 at \$750, and the 8-38 at \$950 being continued. Production plans of the 24 call for 15,000 for 1916, while 10,000 of the other Briscoe models is the production figure set for the new year.

The company also will manufacture on the Briscoe 24 chassis modified to suit commercial requirements, 5,000 light delivery cars to sell at the same price as the touring car. These delivery vehicles will be unique in that they will have a standard open body. Detachable flare-boards will be supplied, and if desired top, side and rear panels. Thus the purchaser will be able to have available any type of commercial body, changes being accomplished in a very short time.

#### Single Four for Case

For the 1916 season, the J. I. Case Threshing Machine Co., Racine, Wis., maker of Case motor cars, is confining its activities exclusively to the production of a single four-cylinder model, which is listed at \$1,090, a reduction of \$260 in the price of the least expensive of the three four-cylinder models put on the 1915 market by this concern.

Case is one of the many concerns that have been converted to the longer stroke and smaller bore policy. As a result, the motor of the four for 1916 has a stroke of 6 inches and a bore of 3½ inches, a reduction of ⅛ of an inch from the smallest bore and an increase of ½ inch to the longest stroke of any of the 1915 models. The motor, which is of special Case design, is of the L-head type whereas the motors of last season were T-head. The engine is cast in block and is integral with the crankcase. It is claimed to develop from 40 to 45 horsepower.

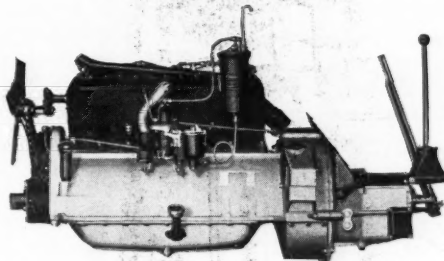
Westinghouse ignition, starting and lighting equipment is used and the lubrication is of the force-feed type. The gasoline tank is in the cowl, so the feed to the

carburetor is by gravity. The clutch is of the cone type, a feature of previous Case models.

One feature of the new Case is the removable upholstery, which is made of grain patent leather, permitting the owner to have as many sets as his fancy dictates.

#### Features of Cole Eight

The latest Cole eight, while having the characteristics that have identified this make of multiple-cylinder car for the past 12 months, has several new features that



Power plant of the new Auburn

the manufacturer claims should add to its appeal.

The Cole eight for the present season is equipped with the same 70 horsepower motor of 346.4 cubic inches piston displacement that was used in its predecessor, though various improvements and refinements have been worked into its construction. As it is now constructed the motor will have a counter balanced crankshaft and improved light pistons, two features which stamp it as an improvement over its forerunner of the last season.

The wheelbase of the present model has been increased to 127 inches. This allows an increase of 3 inches in the length of the rear compartment. More advanced lines have been worked into the design of the body, also. To accentuate the graceful streamline effect, a wive-like center cowl has been added. This is divided, however, to afford individual front seats and a clear passageway from the driver's compartment to the tonneau.

The auxiliary seats, instead of folding up against the front seats, as was previously the case, now are invisible when not in use, but in position, they are arranged as to allow more comfort than in the previous model. The rear seat has been increased to 48 inches in width, and the cushions are deeper and lower, the passengers riding farther down in the car.

Of special interest is the present spring

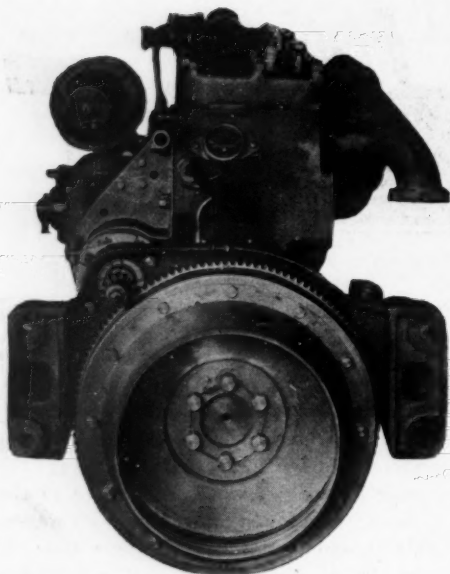
suspension. The rear springs are 57 inches long; the front springs, full 39 inches. Both are semi-elliptic and fasten underneath the frame. The rear spring is swung underneath the rear axle, bringing the center of weight of the car closer to the ground, yet allowing ample road clearance. This improvement on the former Cole direct drive, insures easy riding qualities and is calculated to eliminate all road sway. More than ever is it said to act as a built-in shock absorber to take up all road jolts and prevent skidding. The leaves of the spring measure 2¼ inches in width and are of the self-lubricating type.

As in the former Cole 8, the present model has the Delco separate unit electric equipment for starting, lighting and ignition. The Stewart vacuum-gravity gasoline feed system has been continued in the new Cole.

#### Cunningham Has Fine Body

The Cunningham eight, designed and built in the parent factory, is the product of a firm who prides itself on the handsome bodies it can build, and the main feature of the exhibit is a small touring car of unique exterior. There is nothing freakish about the job, it being easiest described as a combination of the streamline type with the boat body. All horizontal lines seen in side view are straight, and a light bead runs from end to end about 5 inches below the top of the side wall. From this point upwards the sides "tumble home" to use the marine expression, that is they are rounded over so that they curve smoothly into the cross section of the front and center cowls. The seats are not divided, but the backs are mounded slightly to make a division between driver and passenger, and between the rear seat occupants. Finished in dark, dull grey and with wire wheels, the car gives a good impression of power and solidity.

The Cunningham eight-cylinder motor is 4¼ by 5 inches. It has detachable cylinder heads and is set rigidly in the frame, the aluminum crankcase having four supporting arms. The Brown-Lipe transmission, which is bolted to a bell housing on the motor, carries the Westinghouse starting motor on its side and the tire pump is set high up on the fan bracket, so the V is fairly clear of parts and the valve mechanism reasonably accessible. There is a particularly wide center bearing, the cylinder castings being provided with a large water way between the middle bores,



*Flywheel end of model T Case motor*

and the oil is put in through fillers located on the heads of the cylinders midway of the length. Altogether the engine is extremely robust and in keeping with the rugged chassis.

The rear axle is a heavy-pattern Timken, and is provided with a massive pressed-steel torque arm which is anchored to the frame by a short leaf spring, and the frame itself has an exceptional section. Three-quarter elliptic rear springs are used. With touring body, the price of this new eight is \$3,750.

#### **H. A. L. Has Weidely Motor**

The second new twelve at the show is exhibited in touring car form and has the Weidely motor, which is precisely similar to the engine as originally made. The body is a spacious seven-passenger type with high, straight sides and the radiator high and narrow with a squarish top, the impression given being distinctly speedy. Full specifications and other details are not yet in sufficiently definite shape to permit a more extended description.

#### **Hudson Super-Six Appears**

There has been much speculation as to the details of the new Hudson six, but all this is swept away with its appearance at the show. Interest especially centers in the motor, which is the first to be built by the Hudson company under its own roof, and it is evidently destined to mark a new epoch in the development of sixes, for with the same bore and stroke as that of the previous model Six-40, it develops 80 per cent more power.

Of course, the engine is a higher speed type than the previous design, running upwards of 2,600 and 3,000 revolutions per minute, this having to do with the added power. To take care of the higher speed, the valve openings have been considerably increased, and the four crankshaft bearings have been enlarged as compared with the Six-40. Whereas the Six-40 was a good example of six-cylinder practice, delivering a maximum of 42 horsepower, the

new engine with the same displacement of 288.6 cubic inches and the same bore and stroke of  $3\frac{1}{2}$  by 5 inches, develops a maximum of 76 horsepower.

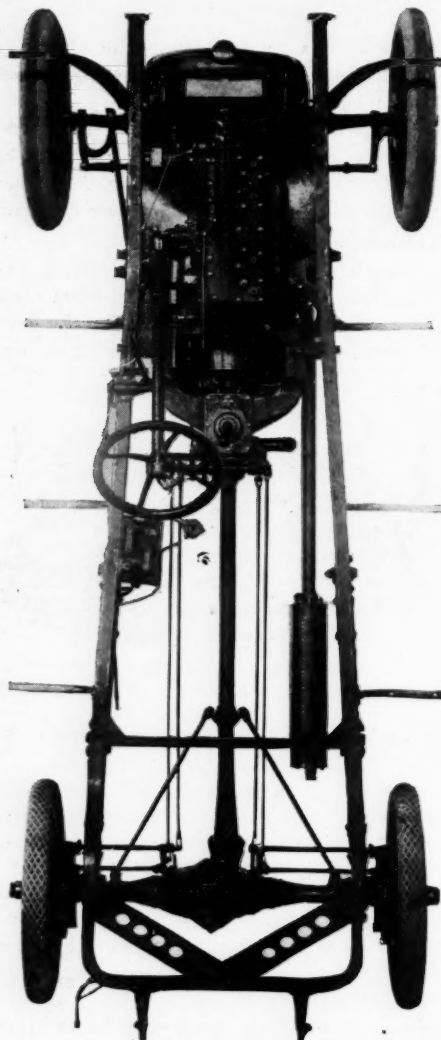
Although the new car is vastly superior to anything before built by Hudson, it sells at about the same price as before in the open models. The figure is \$1,375, which is \$25 more. There are four attractive closed body types at figures ranging from \$1,675 to \$2,500. Body designing

has not been lost sight of in the attention that has been paid to the engine, and the body lines are entirely new, departing from the yacht-line idea of the former Six-40. The radiator is higher, and the body lower with more room especially in the front compartment. As compared with the Six-40, the wheelbase is  $2\frac{1}{2}$  inches greater, being 125 $\frac{1}{2}$  inches. The passengers sit lower in the car, and there is the popular double-cowl effect. That is, there is a sort of modified dash, finished the same as the body sides, in place of the seat backs formerly constituting the division between the two compartments.

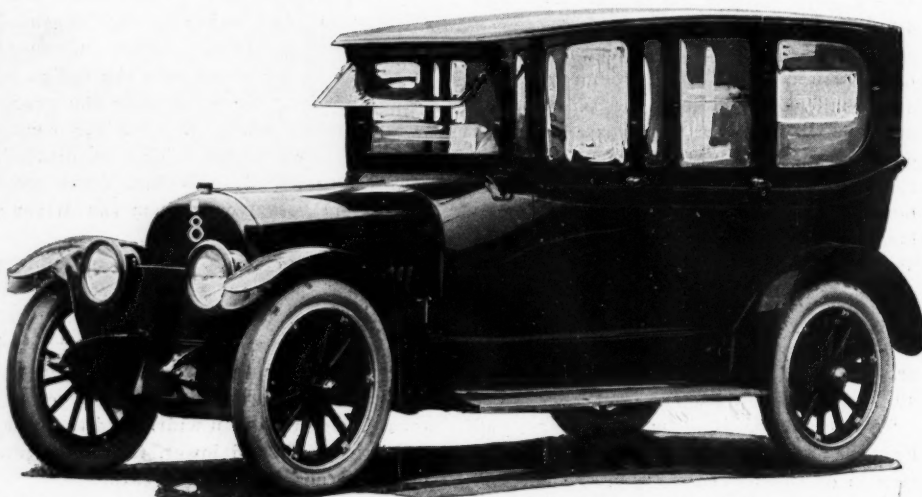
Among the other differences in the car as compared with the previous model are, in addition to the entirely new design of motor, a new carbureter designed by Hudson which is of a type operating pneumatically, redesigned Delco starting and lighting, removal of the gasoline tank from the cowl and its location at the rear in connection with Stewart vacuum feed, new rear spring suspension of semi-elliptic type instead of three-quarter elliptic, and a corresponding change in the rear of the frame to take care of these springs. Such details as the three-speed gearset in unit with the engine, the multiple-disk clutch and the Hotchkiss type of drive remain practically the same as in the previous model.

#### **Haynes Announces Twelve**

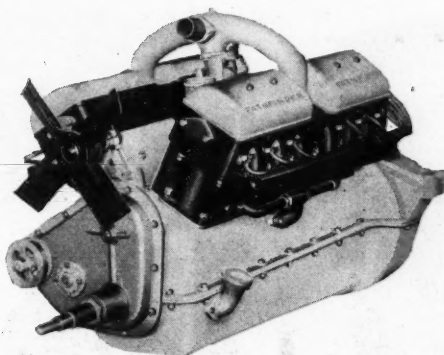
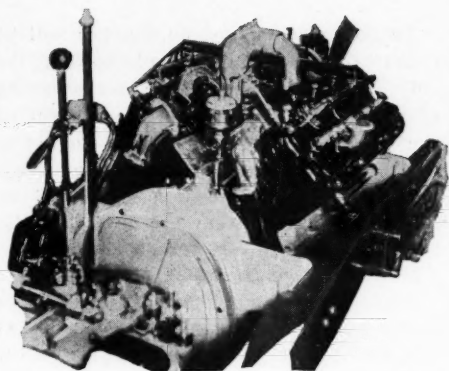
The Haynes Automobile Co., Kokomo, Ind., unveiled at the New York show its new twelve, and the car is the same in every respect as the model 36 of six cylinders except for the motor, and lists at \$1,885 as a three-passenger roadster and five-passenger touring, and \$1,985 as a seven-passenger touring. Thus the incorporation of the twelve motor instead of the six adds \$400 to the price of the car, which is known as model 41. The twelve motor is a V-twin with the two sections of six cylinders block-cast. Though the exact dimensions of the cylinders are not announced it is known that they are such as to give a light high-speed motor of high-power capabilities. Aluminum pistons are used and the motor is suspended at three



*Bird's-eye plan view of the model T Case chassis*



*New eight-cylinder model brought out by Cole company at New York show*



At the left is the Cunningham eight motor and at the right the Weidley powerplant such as is used in the H. A. L.

points. The cylinder castings are such that water is provided between the cylinders and around the valve seats.

#### Lescina Fours and Sixes

Several examples of the Lescina fours and sixes are exhibited, these having been assembled from good quality components, the precise make of which is not yet settled. The program calls for ten different types of bodies including touring, roadster and cloverleaf passenger cars and a light delivery, or express wagon. The seven-passenger six is listed at \$1,212 and the five-passenger four at \$888, roadster bodies being optional at the same prices. Ward-Leonard lighting and starting is used. The frames are very wide so as to give the best possible support to the bodies.

#### Paige Six Called Fleetwood

The Paige company announces a new light six of the five-passenger form to sell at \$1,050 and known as the Fleetwood Six-38 model, it replacing the Hollywood model that sold at \$1,095. It is offered as a better car with greater value, despite the reduction in price. It has a larger and roomier body of more beauty of line, and is propelled by a larger, more powerful and smoother-running engine than the model it supersedes, and besides these differences, it has higher quality upholstery, paint and finish.

Five inches have been added to the wheelbase, bringing it to 117 inches, and the increased power is mainly attained by adding  $\frac{1}{8}$  inch to the cylinder bore, making it  $3\frac{1}{8}$  inches. The stroke remains 5 inches. This increased diameter boosts the N. A. C. C. rating from 21.6 to 23.5 horsepower, and the displacement from 212 to 230 cubic inches. The advertised horsepower is now 38, and much attention has been paid to engine balance, this also having to do with the greater power. As a step in this direction the crankshaft has been enlarged  $\frac{1}{4}$  inch, and it now operates on three 2-inch bearings of  $2\frac{1}{2}$ ,  $2\frac{3}{4}$  and  $3\frac{1}{8}$ -inch length, front to rear. Much the same general design of the power plant is found, with the cylinder head detachable from the main cylinder block and the gearset in unit.

Other features of the chassis are a multiple-disk clutch, propeller shaft inclosed

within a torsion tube, 44-inch cantilever rear springs, and 32 by 4 tires. In other respects, as in the general motor design, practically the same construction is used as for the previous model.

In addition to those motor changes that are conducive to more power, there are a number of smaller refinements that are worthy of attention. The forcing of oil to the main bearings and the timing gears is made more positive by a plunger pump operated by an eccentric on the camshaft, this taking the place of the formerly-used vane pump on the end of the camshaft. The main bearing caps are now held by four bolts instead of two, which makes a more substantial construction, and a point that should assist in maintaining compression is the fitting of three rings to the pistons instead of two. To aid in silencing the helical timing gears, a silk intermediate gear replaces the former iron one, so that neither gear with which it is in contact works against a metallic surface.

#### Peerless Is Thorough Design

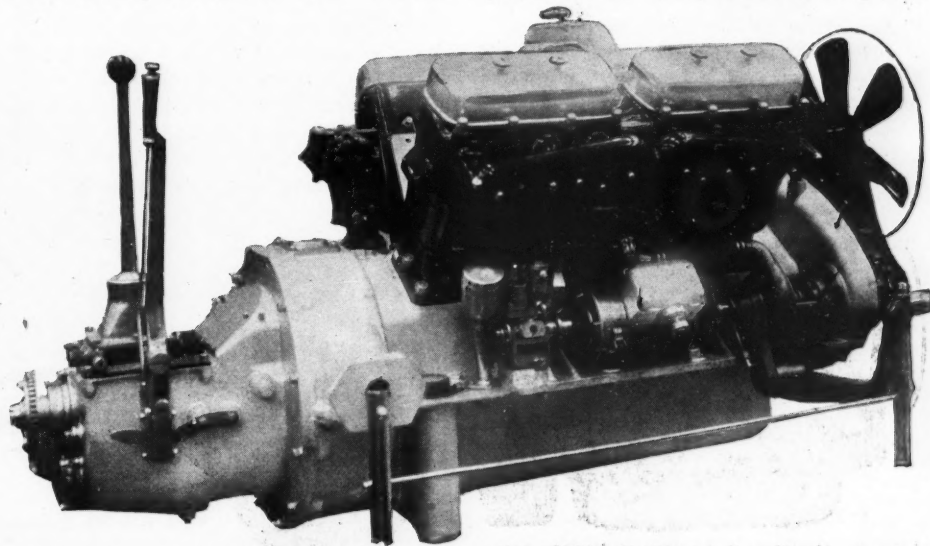
In the last issue of Motor Age some general particulars of the new model Peerless were given. It is a  $3\frac{1}{4}$  by 5 inch eight with 125-inch wheelbase and the touring car sells for \$1,890. Broadly, the design is not conspicuous for any departures from conventional good engineering, but the detail is worked out with much care and a great deal of skill. The en-

gine is that type of eight in which the cylinders are staggered just enough to permit the use of side-by-side connecting rod bearings, has a three-bearing crankshaft with exceptional bearing area, and L-head cylinders, its most impressive feature being the spaciousness of everything about it. There is ample room for everything; no accessories are crowded together, and every essential thing is really accessible. In the V is the carburetor, of course, and just in front of it the tire pump, as this is a small enough part not to interfere with the valve tappet accessibility. The pump has a very simple clutch, as its spindle carries a hexagon head and the back end of the fan spindle has a hexagon cup to match.

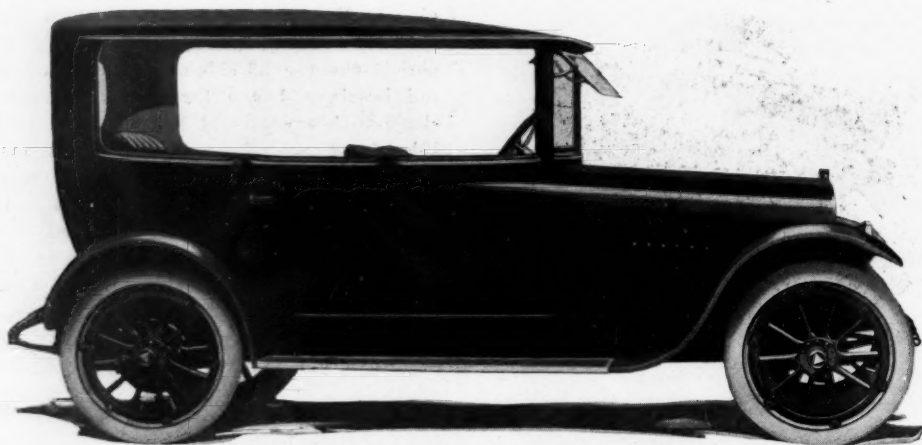
The oil filler cap stands on the right well to the front of the motor, and the water pump and generator are situated at right and left ends respectively of a cross-shaft which is driven from the crankshaft and lays low across the front end of the crankcase. The cranking motor is on the side of the crankcase, at the right, engaging the flywheel with a Bendix pinion.

The carburetion system is rather interesting, and the instrument itself is a duplex pattern of special design, and feeds into manifolds that are also duplex, there being four ports in each cylinder block which are divided across the center, the upper passage going to the exhaust valves and the lower to the intake. The manifold has thus two parts, the upper for exhaust and the lower for intake, and the gases are kept well warmed without the need for any water jacket for the intake system. Battery ignition is employed, the distributor being at the rear end of the V on a vertical spindle driven off the camshaft.

Lubrication is by pressure, all the bearings having a forced feed. Another feature of the powerplant, which combines three three-speed gearset, is the remarkably light pedal pressure needed to release the dry-disk clutch, since there is a multiplying system of levers between the pedal and the actual clutch striking fork.



Powerplant of the new Haynes twelve-cylinder job



*Hudson Super-six touring sedan with sash and pillars lowered*

Peculiarity is also noticed in the frame of the car, as this is a fairly light section, strengthened by a king post and truss rod on each side. This system of construction gives great strength with little weight, and it is surprising that it has not been used more extensively. The rear axle, with a pressed-steel casing and spiral gears, is quite conventional, as is the brakework, but the latter is noteworthy for the care with which the operating rods have been laid out so as to give ample rigidity. None of the pedal pressure is lost anywhere through whip or spring in the connections.

The body of the touring car emphasizes that the car is the product of a firm of repute and long standing. It is an entirely modern type of flush-side design but free from any extreme of fashion. As would be expected of a Peerless car, the finish is everywhere thoroughly excellent.

#### **Sterling Four Very Clean Chassis**

Selling for \$595 with roadster body equipment the Sterling is a new car in which low cost has been obtained by studied simplicity. The powerplant is a Sterling 3 by 4¼-inch, with overhead valves and well-lubricated rocker arms. A detachable head gives ready access to the valves. Driven from the camshaft is a plunger oil pump delivering to troughs in which the connecting rods drip the feed from trough to trough and then back to the pump, being successive.

The clutch is a leather cone, and the gearset, which has ball bearings, is bolted to the crankcase by two arms that embrace the flywheel. Starting and lighting is performed by a two-unit system, the

generator being driven by silent chain, and the motor making engagement by a Bendix pinion.

The frame is very wide, so that the cantilever springs at the rear can be mounted directly beneath it, thus giving direct support to the body. A neat rear axle is employed, this having wide brake drums with two sets of shoes in each, so there is no external brake, both service and emergency being expanding.

#### **Scripps-Booth Features Bodies**

The Scripps-Booth eight exhibit is designed to feature the complete cars rather than the chassis. The eight is but little larger than the four, having the overhead valves with very simple adjustment for the tappets. The space between the cylinders is not required for any adjusting process, and it therefore serves as an ideal place for the single unit lighting and starting apparatus. The complete eight still looks a quite small car, though a trifle greater in height than the four, and it has the same style of body.

The new eight, with 2½-inch bore and 3¾-inch stroke, is said to develop over 35 horsepower at 3,000 r. p. m., and while this power perhaps will not be an absolute necessity in a vehicle of this size, it is pointed out that it is designed primarily for the man who wants something out of the ordinary. The Scripps-Booth concern states that this new eight is being produced of a completeness and extreme equipment which takes it out of the price class of the four-cylinder model. The latter sells for \$775 as a roadster, but the eight roadster will sell at around \$1,100, the price not being definitely set as yet.

To the ordinary eye, no changes will be noted between this eight and the four, the only differences being in the strengthening of parts to withstand the extra power of the engine. The four-cylinder engine is also a larger size and different in design from that heretofore used. Instead of 2⅞ by 4 cylinders, they are now 3 by 4¼, increasing the horsepower output to 21 at 1,800 r. p. m., it is stated.

Among the types exhibited there is a particularly striking speed model called the Vitesse. It is a rounded, high-sided roadster, with the usual Scripps-Booth staggered seating, and has no doors, a couple of aluminum steps on the side giving access to the seats over the side. With very small mudguards front and rear and no running boards the car has a most rakish look.

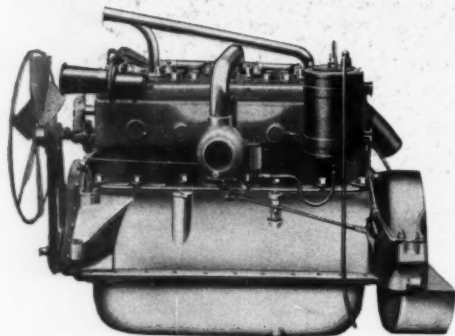
Of the other cars, different body styles of less unconventional design are shown, and these differ little from the 1915 type. One alteration is the abandonment of the quilted leather finish of the cowl board in favor of the more customary polished wood. In all, the car has been improved considerably in both appearance and comfort by changes of small detail.

#### **Studebaker Uses Stewart Feed**

Although mechanically the Studebaker four- and six-cylinder chassis are practically the same as they were, there is one noticeable difference in the adoption of the Stewart vacuum gasoline feed and the removal of the gasoline tank from the cowl to the rear of the chassis. Most of the refinements have come in the bodies, some of them as a result of this tank removal.

There have been some revisions of prices, too. The fours all are cheaper. The seven-passenger four-cylinder touring car is now offered at \$845 instead of \$885; the roadster is \$25 less at \$825 and the landau-roadster is \$1,145 instead of \$1,185. But where prices have been changed in the sixes they have gone slightly upward. The seven-passenger touring car stays at \$1,050, but the six roadster is boosted from \$1,000 to \$1,025. The Landau roadster is the same as it was at \$1,350, but the six coupe is \$1,600 instead of \$1,550; and the limousine has been raised \$250 to \$2,500. On the six chassis, a new body type also has appeared in the form of a seven-passenger sedan that sells at \$1,675.

Studebaker motors have a bore of 3⅞ and a stroke of 5 inches, with advertised



*View of carburetor and motor of Hudson super-six*



*Chassis view of the new Peerless eight-cylinder car*

horsepowers of 40 and 50 for the four and six, respectively. The cylinders are L-heads with valves and manifolds on the left, and the whole power plant is quite conventional throughout with the exception of the mounting of the lighting and starting units which are of Wagner make. The generator is positioned vertically at the front and driven from a helical gear in mesh with a gear on the crankshaft, while the starter is at the right of the engine and engages the crankshaft through a roller chain drive with an over-running clutch to prevent the starter from running when the engine is operating.

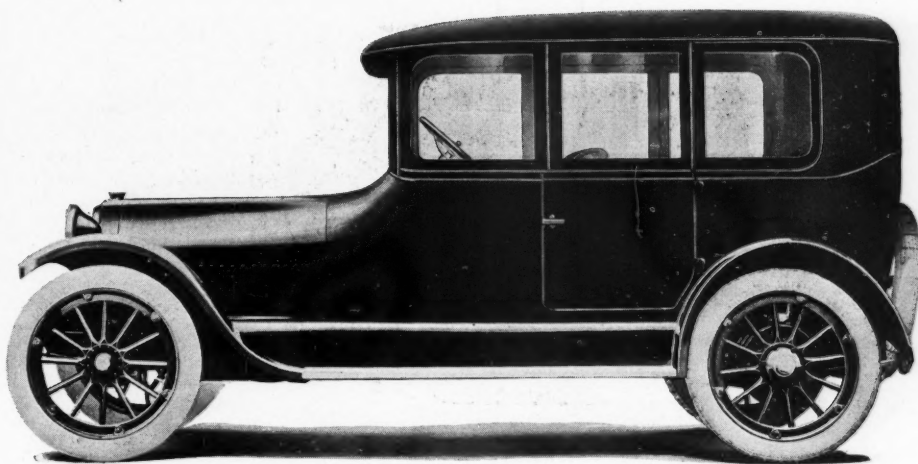
In the Studebaker application of the vacuum tank, it is placed on the intake manifold immediately above the carburetor so as to give very positive feed with a minimum of piping. The manifold has been shaped to allow the attachment of the tank rigidly.

Other than the changes above enumerated, the new series Studebakers are closely related to the preceding series. Uniformity of design in both chassis as well as power plants is very evident, standardization being fostered wherever possible. The chassis is of the type in which the gearset is in unit with the rear axle.

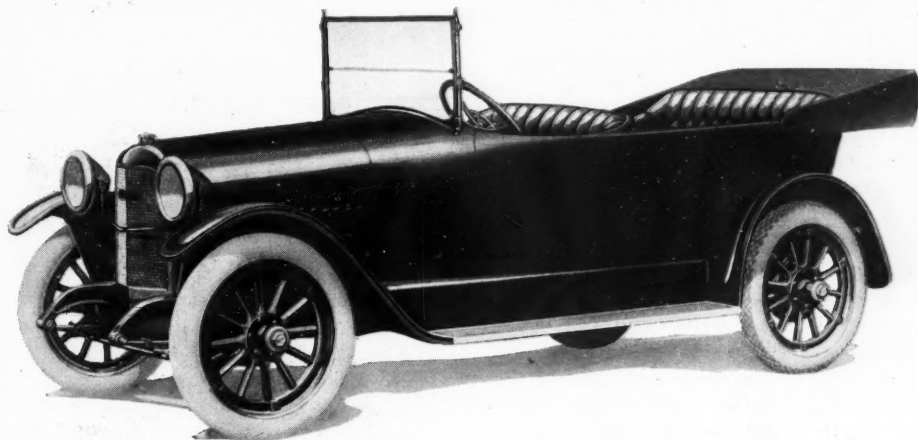
#### Sun Makes Own Motor

Since the announcement of the formation of the Sun company last summer, a design has been developed, and the model is shown for the first time. It will be built at Elkhart, Ind., and production will begin almost at once. The price of the five-passenger touring car will be under \$1,000 but is not yet settled definitely.

The motor is a 3 by 4-inch six made in the Elkhart plant and having several special features. It is a block-cast job with crankcase in unit with the cylinders and its chief outside peculiarity is that the exhaust manifold discharges into the pipe midway of the cylinders instead of at the end. At the center of the manifold a special part of the casting takes care of the hot-air supply to the carburetor, which



*New series 17 Studebaker six seven-passenger sedan*

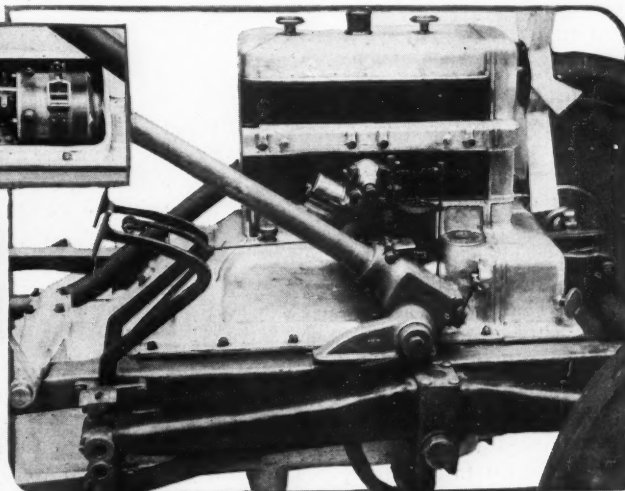
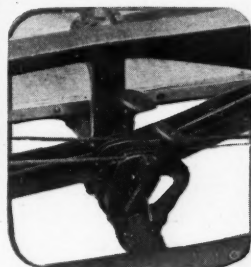
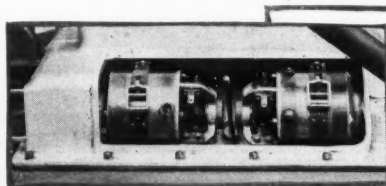
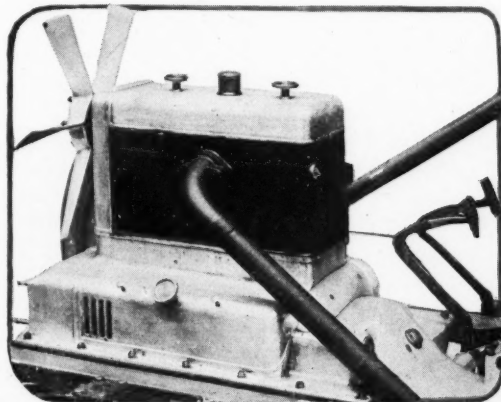


*Model six-38, five-passenger Paige, known as Fleetwood*

bolts to the cylinders direct on the opposite side of the block. For the valves a finger tappet is used, something like that of the small Overland, and all the valve mechanism is thus both inclosed and lubricated. Oiling is by a flywheel system in which the lubricant is forced into the pipes by the centrifugal action of the wheel. It is stated that this motor has the highest compression of any stock motor.

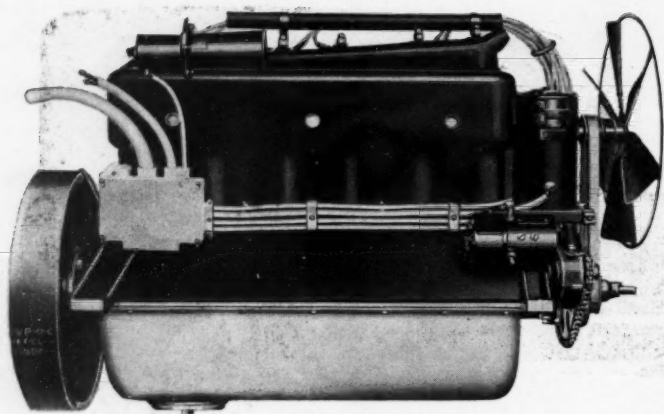
Cooling is thermo-syphon and fuel feed the Stewart vacuum-gravity system, while the electric equipment is to be Remy two-unit, the distributor being combined with the generator.

Another novelty is the use of a pressed steel banjo which is bolted between the crankcase and the gearbox in the middle of the bell housing, the ends of the banjo making the rear motor support on the frame. The rear axle is a floating pat-



#### DETAILED MECHANICAL VIEWS OF THE FERGUS CAR, DESIGNED BY J. B. FERGUSON, BELFAST, IRELAND

At the extreme left is shown the motor in which the spark plugs are protected by a cover which has cut-out buttons. In the center, above, is the generator and starting motor. These are inclosed on the left side of the motor, just above the crankcase, the cover being seen in the motor view at the left. The section having slots therein is removable and gives access to the generator and starter. The carburetor draws its air supply through the slots seen in this cover. Below in the center is shown the wire cable which operate the brakes



Right side view of the Studebaker series 17 six-cylinder motor. This is an L-head type rated at 50 horsepower by the manufacturer

tern with pressed steel casing, springs semi-elliptic all around and the tires 34 by 4 inches.

Production will begin with a five-passenger touring car, like that exhibited, and a roadster will be added very shortly afterwards.

The show reveals for the first time many developments toward greater mechanical accessibility, greater refinements in finishing and furnishings, all tending toward the *care de luxe*. Advancement made in 1915 and displayed in the 1916 models is greater, perhaps, than has been noted in any other one twelvemonth of the industry. Better body lines—lines that appeal to the eye, together with the nearer approach to mechanical perfection make themselves evident at the first show of the new year.

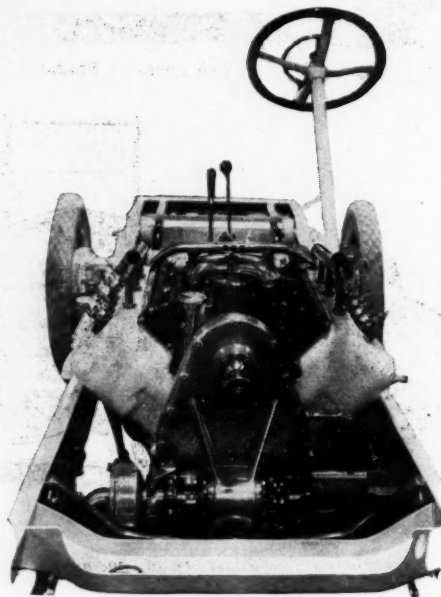
#### WESTCOTT NOT IN MERGER

Richmond, Ind., Jan. 4—The recent publication of a rumor that the Westcott Motor Car Co. is to enter a combination of Indiana motor car and motor car parts companies has brought a vigorous denial from H. G. Root, general manager of the Westcott company. Mr. Root declares that the Westcott company will not enter the proposed merger and has not even been contemplating such action.

#### GOOD ROADS TALK FIRES DIXIE

Nashville, Tenn., Jan. 3—An interesting result of the establishment of the many trunk highways through the southern states has been the competition developed between various communities for routing and, along with this competition, the organization of many highway associations. Most of the Dixie highway has been definitely settled, but there are two opposing routes in Georgia clamoring for recognition and the entire commission will be called upon to choose between them. Both routes have begun activities looking toward the building of roads that will be pleasurable to tourists.

The Jackson Highway Association has a vigorous conflict to decide between the Alabama and Mississippi routes south of Nashville. The Alabama advocates themselves must fix upon one of two mappings for part of the link in that state, as Baldwin and Monroe counties are competing with Wash-



Rear view of Peerless eight-motor

ington and Clarke. Baldwin is preparing to issue bonds while Monroe has contracted for the construction of 60 miles of roads. Similar activity is taking place in the other two counties.

Three highway associations were formed in the Ozark mountains by various Arkansas towns during the past week in order to bring the Jefferson highway through that region which undoubtedly will prove interesting to motorists. Texas and Oklahoma cities are also working hard to secure this road, which is to extend from New Orleans to Winnipeg. The selection of the route will be made by the board of directors, composed of one vice-president from each state. Although the Jefferson Highway Association was formed only last November, plans have been made by a number of sections for early construction work.

#### FACES SUNDAY GARAGE PROBLEM

Birmingham, Ala., Jan. 3—A difference of opinion among Birmingham garagemen as to Sunday closing has been taken to the city commission and the members of that body are finding the question one of considerable perplexity. The commissioners have four elements to consider in their judgment and the impossibility of reconciling them is the cause of considerable worry.

One element is composed of those garagemen who want to take their ease when Sunday comes around, but cannot, as long as their competitors remain on the job. Opposed to them are the garagemen who do not want to lose the day's business and who feel that the convenience of their patrons demands their remaining open. Agreeing with them is the third element, the motorists who want Sunday service. The fourth class is composed of ministers and others who believe in a tight lid.

The question came up through the petition brought by a delegation of garagemen favoring Sunday closing, who wanted the commissioners to order a cessation of labor on the first day. A prominent motorist, who was present, interposed an objection to the granting of the petition. One of the commissioners, who favored the petition, declared that the commission could not countenance the violation of its own ordinances by refusing to take action, but the president of the commission announced his opposition to a too strict interpretation. One argument offered in favor of the closing resolution was that groceries had been ordered closed previously. The resolution was passed by a vote of three to two, but the opponents of the closing plan persuaded the others to permit postponement of the official vote until a hearing can be held.

#### REO TURNS DOWN WAR ORDERS

Lansing, Mich., Jan. 3—The report that the Reo Motor Truck Co. was approached some time ago with regard to furnishing 1,000 trucks to one of the European belligerents, has been confirmed by R. C. Rueschaw, sales manager of the company, who stated that the order was not accepted because Reo is not looking for business from those countries at this time. The real reason is that the domestic business of the Reo Motor Truck Co. has been increasing so rapidly that it has not been possible to take care of it as would have been desirable. To have accepted the foreign order would have been the cause of still greater disturbance in taking care of the American business.

#### WILL MAKE DIXIE CARS

Louisville, Ky., Jan. 4—At a special meeting held Friday, a contract whereby the Kentucky Wagon Mfg. Co. will assemble motor cars for the Dixie Motor Car Co., a concern in process of organization, for a period of 5 years, was approved by the stockholders. The proposed motor car concern will pay the wagon company a stipulated sum to assemble the cars and manufacture certain parts. R. V. Board, president of the wagon company, will be president of the wagon company's new enterprise. He announced to the wagon works shareholders at Friday's meeting that they would be privileged to subscribe to stock in the motor car company on a pro rata basis if they so desired.

## The Motor Revue of 1916

(Continued from page 9)

in which the body lines follow somewhat the outline of a ship's hull up to about three-quarters of the height of the sides. At this height, which might correspond with the water line of the boat, the sides are carried in quite abruptly. The whole conception leaves the impression that if the car were to be run into the water it would float away gracefully without any trimming.

Oldsmobile has a very pretty little wire-wheel coupe in white and silver, which has an effect of daintiness that is quite impressive.

The new Scripps-Booth eight-cylinder speedster model which is called the Vit-esse, the word being French for speed, looks as though it were a special show design, but on the contrary, it is to be part of the regular production on the eight-cylinder chassis. This speedster is extremely European in line, has no running board, but steps instead, which offer an opportunity to step over the rather low side of the car. There are no doors.

### Some Exhibits of Color

Some of the others, which have specially-trimmed cars on display, have developed some striking color schemes. Hupmobile has a canary yellow touring car in which the double cowl idea is incorporated. Chandler has a white touring car with a sort of bridal suggestion to it. Reo has a new double cowl vestibule body of special color design. Packard has a white and gray town car as the color feature of its booth. Pierce-Arrow and Abbott-Detroit each have an olive color scheme on touring cars. Mitchell has a canary touring, Cole is featuring a brilliant red roadster, Maxwell has a dainty inclosed car and Chalmers and Locomobile each have a number of bodies with unusual color combination which though considerably quieter than some of the more eye-catching chromatic schemes, show an unusual attention to color in their finish. In fact the whole show seems to be somewhat more brilliantly colored than it has been in previous years. There is not so much of the blacks and dark blues and greens as have been found in the past, although it must be said that the rush to new color combinations has not had the widespread effect that was to have been expected last spring. It is quite probable that the European war, with the attendant increase in cost of coloring basis, has had a retarding effect on this movement.

What is probably the most elaborate of the chassis displays is a gold chassis which is one of the features of the Studebaker booth. It is one of the standard chassis which has been covered with a brilliant gold finish. It is valued at \$25,000 and rather elaborate precautions have been taken to guard it from the depredation of souvenir hunters. Probably this is the most expensive chassis which has ever

been on exhibition and it is quite likely is costlier than any complete car in the history of motor car shows.

Among the concerns in which the chassis is made part of the exhibit are the Hupp, Franklin, Haynes, Briscoe, Velie, Packard, Reo with a cutout chassis, Dodge, Chalmers, Cole eight, Marmon, Apperson and Allen.

The usual number of lecturers who explain in detail the mechanical features of particular cars are in evidence at the booths of several of the exhibitors. Mitchell's lecturer, with the cutout chassis which has been the feature of the Racine concern for a number of years, is as compellingly in evidence as ever.

### LOZIER ANNOUNCES NEW MODEL

New York, Jan. 5—Lozier show announcements include the introduction of a new six-cylinder car to sell at \$1,875, the reduction of the larger six from \$3,250 to \$2,775 and the reduction of the four from \$2,100 to \$1,595. The new model is slightly smaller in size than the six on the market a year ago and includes a motor which is claimed to develop 50 horsepower on the block. Full specifications have not as yet been announced but the details of design and appearance do not depart from previous Lozier practice.

### KENNERDELL GUEST AT DINNER

New York, N. Y., Jan. 4—A complimentary dinner was tendered Richard Kennerdell, chairman of the A. A. A. contest board, last night at the Biltmore by President Wilson of the American Automobile Association, and thirty of his associates on the contest board. Kennerdell was presented with a watch in recognition of his services as chairman.

### REORGANIZING WHITE CO.

Cleveland, O., Jan. 3—The White Motor Co., successor of the White Co., manufacturer of motor cars and trucks, has not yet been permanently organized, but the detail of the transfer of the business to the new company is being worked out as rapidly as possible.

Under present plans, the directors of the new company will include Windsor T. White, Walter C. White and E. W. Hulett, of the present operating organization; M. B. Johnson, prominent attorney of this city, and the following New York men: J. Horace Harding, Theodore Roosevelt, Jr., E. R. Tinker, vice-president of the Chase National Bank, and Alexander M. Hall, vice-president of the Liberty National Bank.

As yet no information is at hand as to the real interests that have bought into the company, further than may be surmised from the new names which will appear in the directorate.

The operating organization will remain as it was under the White Co. and it has been reiterated that there will be no change in the policy of the management.

## New York Show Figures

	Grand Cent. Pal.	Grand Cent. Pal.	Grand Cent. Pal.	Garden Cent. and C. Pal.
	1916	1915	1914	1913
Total exhibitors.....	376	317	349	424
Car exhibitors.....	86	80	78	89
Accessory exhibitors	290	223	259	320

### GASOLINE CARS (INCLUDING STRIPPED CHASSIS FOR 1916)

	Grand Cent. Pal.	Grand Cent. Pal.	Grand Cent. Pal.	Garden Cent. and C. Pal.
	1916	1915	1914	1913
Two-cylinder .....	0	0	2	0
Four-cylinder .....	116	96	132	169
Four-cylinder (piston valve).....	0	0	1	0
Four-cylinder (sleeve valve)....	8	10	8	6
Eight-cylinder (sleeve valve)....	3	0	0	0
Six-cylinder .....	136	105	98	86
Six-cylinder (sleeve valve)....		1	2	4
Six-cylinder (crescent valve).....	0	2	0	0
Six-cylinder (rotary valve) .....	0	0	1	1
Eight-cylinder .....	42	7	0	0
Twelve-cylinder ....	13	0	0	0

### TOTAL GASOLINE PASSENGER CARS

	Grand Cent. Pal.	Grand Cent. Pal.	Grand Cent. Pal.	Garden Cent. and C. Pal.
	1916	1915	1914	1913
Total gasoline cars..	251	221	264	266
Touring cars.....	117	124	143	162
Roadsters .....	77	48	50	49
Demountable top....	15	2	0	0
Limousines .....	11	18	15	23
Berlines .....	1	2	6	8
Coupes .....	6	7	17	*19
Sedans .....	11	6	14	0
Cabriolet .....	5	4	5	0
Town cars.....	5	0	0	0
Landaulet .....	3	1	1	0
Phaeton .....	0	1	2	1
Brougham .....	0	4	0	0
Raceabout .....	**	3	2	2

Total .....	251	221	264	266
Air-cooled cars.....	3	3	6	5
Water-cooled cars..	248	218	258	261
Total .....	251	221	264	266

### STRIPPED CHASSIS

	Grand Cent. Pal.	Grand Cent. Pal.	Grand Cent. Pal.	Garden Cent. and C. Pal.
	1916	1915	1914	1913
Four-cylinder .....	22	20	21	27
Four-cylinder (sleeve valve)....	3	4	0	0
Six-cylinder .....	19	26	15	21
Eight-cylinder .....	8	1	0	0
Eight-cylinder (sleeve valve)....	1	1	0	0
Twelve-cylinder ....	4	0	0	0

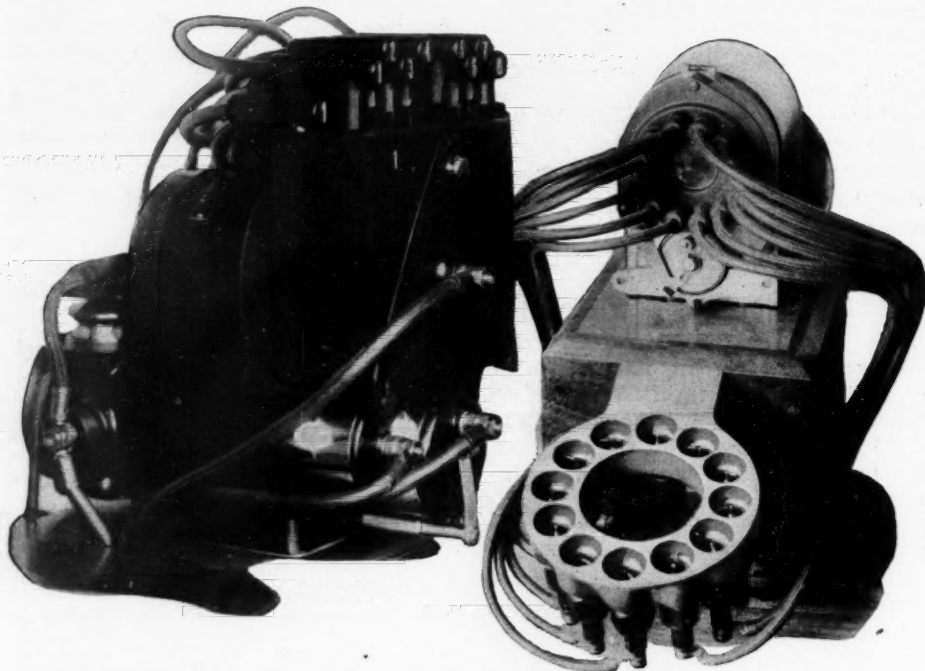
### ELECTRIC CARS

	Grand Cent. Pal.	Grand Cent. Pal.	Grand Cent. Pal.	Garden Cent. and C. Pal.
	1916	1915	1914	1913
Chassis .....	2	†	†	†
Coupe .....	11	1	2	7
Brougham .....	4	9	13	0
Roadster .....	1	3	1	3
Cabriolet .....	1	1	0	0
Town car.....	0	0	1	0
Limousines .....	0	1	0	0

Total (excluding chassis) .....	17	15	17	10
Total chassis.....	2	†	†	†
Grand total, cars and chassis.....	326	286	318	325

# Many Additions to Be Found in Accessory Line

## Magnetos for Eight and Twelve-Cylinder Motors Perfected—Carbureters, Lighting and Starting Systems Improved



At the left is the latest development of the Eisemann twelve-cylinder magneto, while the K-W apparatus for twelves is shown at the right

**T**HERE is the usual crop of new accessories at the Palace as well as a general improvement in the various familiar devices and component parts that go to make up the modern motor car. Improvement cannot be confined to any one branch as refinements and new ideas pervade nearly every booth from shock absorbers to gearsets and axles.

Following the usual custom the show management has seen to it that those who come to the Palace are conveyed to the accessory floors directly from the main floor. Elevators simply will not stop for you on any of the intermediate floors and before you know it you are in the midst of an endless variety of different things associated with the motor car.

### Ignition Exhibits

Most of the ignition makers are exhibiting products which show progress in many ways. The coming of twelves has forced the development of twelve-cylinder magnetos and battery systems, with Bosch and K-W on hand with new instruments of the type as well as Splitdorf, which has had a twelve-cylinder model for some time. The Ericson Magneto Co. also is showing a new line of magnetos. Faster breaker mechanisms have been made necessary by the higher speed motors and also more rapid coil action has been developed. Automatic advance, improved construction of contact points and shorter high-tension leads are also refining tendencies. For V motors the need of perfect synchronism between the distribution of ignition current to the two blocks of cylinders has been recognized and leading toward

greater dependability methods of waterproofing the instruments have also been concentrated upon.

The carburetor display is practically one of the best in the accessory division, there being a very large representation of all manufacturers producing in large quantities, such as Wheeler & Schebler, Stromberg, Rayfield, Zenith, Kingston, Stewart, Carter, Master, etc. In addition to these there is a large crop of other manufacturers, some of which are new at the show. In general the work of improvement by carburetor makers has been along two different lines: First, there are those who have endeavored to give greater acceleration, which is one of the demands of the 1916 car. Rayfield has improved its regular model by incorporating with a secondary jet a pumping action on the gasoline in this jet so that when the auxiliary air valve suddenly opens for acceleration its opening pumps a stream of gasoline through the secondary jet. This is accomplished by the dashpot piston on the auxiliary air valve stem acting as a plunger pump on the opening of the valve. Stromberg has incorporated in model K an auxiliary jet in the metering pin which is moved by the opening of the valve, so that more gasoline is quickly at hand for acceleration purposes. These two examples are typical of the effort to give quick acceleration.

The other line of carburetor endeavor has been that of producing new devices, in some cases entirely new carbureters, and in other instances rearranging existing types. For example, Wheeler & Schebler has its new

model T in which the metering pin in the spraying nozzle is controlled by the auxiliary air valve, whereas in its earlier models the metering pin in the nozzle has been interconnected with the throttle.

### Many Types of Electric Systems

There is a profusion of lighting and starting systems and perhaps the most striking point about them is the lack of uniformity or standardization among them. Each maker evidently has carried out his own ideas of size and shape and method of attachment. Ways of driving starting motors, however, have been commendably simplified, this being greatly influenced by the very wide use of the Bendix method of connecting starter to flywheel. In fact, in nearly every case where the flywheel method of driving the motor is used the Bendix drive is also a part. There seems to be a very definite partiality for the two-unit system as most manufacturers have found it less efficient to combine both motor and generator in one unit, although there are a number of eminently satisfactory single-unit outfits especially adaptable to small motors. Simplification is also evident in the quite general elimination of any means of adjustment of the current regulation so that one setting of the cut-out device suffices for year-round driving. Elimination and shortening of external wiring has been done wherever possible to make the apparatus less apt to get out of order in service. Better protection against dirt and moisture has also been very carefully looked into.

### Some New Spark Plugs

In the spark plug field there are a few new names to add to list of concerns long associated with this accessory. Recognizing the extreme conditions under which the plugs operate, the makers have striven to make them still more dependable by the use of better insulating material surrounding the center electrode. Immunity to variations of temperature and tendencies to greater resistance to heat, as well as added strength, are in evidence in the many special materials now being employed in the plugs.

### Tire Accessories in Profusion

The usual proportion of exhibits of apparatus associated with the care and maintenance of tires is to be found and while there are a few new things, the old standbys are improved where improvement seemed desirable. Most of the power-driven tire pumps have either one or two cylinders and the tendency is to make them lighter and more readily adaptable to motors of all designs. Piston rings are more generally fitted to the little pistons, leading to quicker tire inflation ability.

Whereas other methods of heating portable vulcanizers have held sway up to this time, several of those makers exhibiting them this year have come to the electric vulcanizer idea

wherein some form of resistance unit is incorporated in the vulcanizer to produce heat electrically. Shaler, one of the foremost in this field, has such an apparatus and there are several others. One very attractive feature of an electric portable vulcanizer shown is an automatic device for shutting off the electric current when sufficient time has elapsed for the proper vulcanizing of the rubber, the repairer having only to set the apparatus, after which he can leave it to take care of itself.

#### Spring Shock Absorbers Lead

One or two new shock absorber names are in evidence. The preponderance of the spring type is striking, many of them incorporating a differential action by the use of one coil surrounding another. There are many Ford types shown, as would be expected. One of the leading bumper manufacturers has made decided improvements in his product, although at first thought this device would not seem to lend itself readily to further development. However, in order to make the bumper universally attachable to any form of frame front or spring, a special adjustable bracket has been developed, as an example of what is being done in this very specialized field. There is a tendency for cheaper shock-absorbing apparatus and here and there little refinements have been made in the well-known designs in order to render them still more efficient.

#### Horns Little Changed

Nearly all of the familiar horns are displayed and show little change over a year ago, although refinement is not absent in this specialty, for the aim has been to devise signals of compelling noise possibilities which will use the minimum electric current or manual effort. At least one unique mechanically-operated horn has come out, this being the Long horn. While it operates on a rack-and-pinion principle the actuation of the rack is by a sliding cable which permits

the location of the horn at any desired point and gets away from the old objection to the hand horn that it had to be very near to the driver.

#### Component Parts Numerous

Quite an imposing array of component parts are to be found, such as axles, steering gears, gearsets, wire wheels and the products of a still more specialized nature. Casting manufacturers and others in similar lines are showing how expert they have become in the making of most intricate and difficult pieces. You must get below the surface to discover the differences in the new gearsets, axles, etc., over previous designs because externally they look about the same. Lightness and greater compactness have been striven for and better materials are used. Generally better bearing equipment and mounting of the main shaft and countershaft of the gearsets and of the differential, axle shafts and wheels of the rear axles are the result of slow development that seems to have culminated in the designs shown, not only in the special accessory exhibits but in the cars to be seen elsewhere in the show.

#### Among the New Carbureters

Stromberg is showing a new model without moving parts and which is based on the O'Hara patents. It does not use the auxiliary air valve which has been a feature of Stromberg construction up to the present, in fact the only moving part of the carbureter is the throttle. Externally it is quite different in shape from other types made by this company.

There are two novelties in the carbureter exhibits, one being the Tagel syphoning carbureter which has not a float or any other device to maintain gasoline level, but solely a small pipe leading from the gasoline tank into the mixing chamber of the carbureter. In close position with the opening of this pipe is an air pipe which taps the motor cylinders and through which air is forced on the ex-

plosion strokes. This air striking upon the opening of the gasoline fuel pipe creates syphoning effect which is claimed to be sufficient to lift the gasoline 18 feet through the pipe. The instrument is manufactured by the Turner Brass Works, Sycamore, Ill.

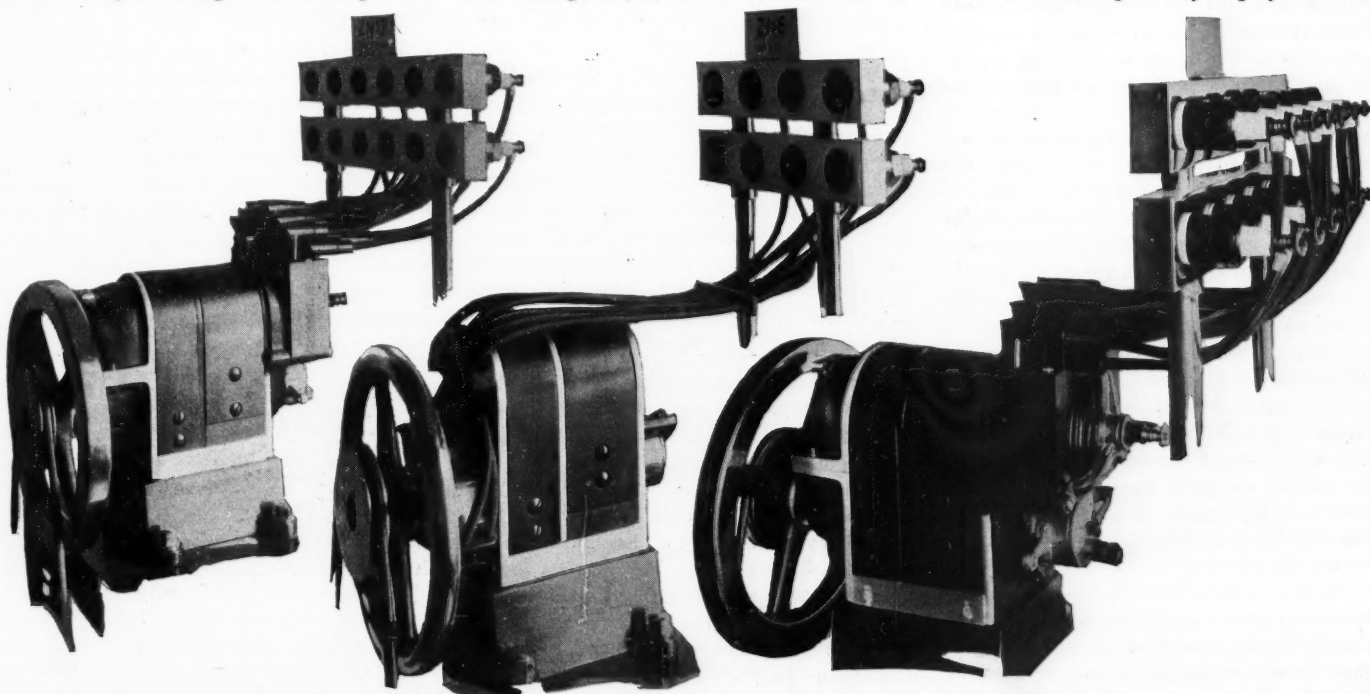
Another new carbureter is the Sunderman, the new model being known as the Mouse Trap in that it bears certain resemblances to that device. The carbureter is a small cubical box, in one side being the float chamber and in the other side the mixing chamber. The mixing chamber is a square section horizontal tube with the air entering at one end and the throttle at the other. In the middle of the tube stand two nozzles, one higher than the other. Between the air entrance and these nozzles is a curve-shaped valve, or door, obstructing the entire passage, and hinged at the top. This door is raised as the motor speed increases and as it rises one nozzle is brought into operation and as it rises still higher the other nozzle comes into use.

A novelty is the Evans carbureter which has a mechanically driven metal drum, which is relied upon to mix the gasoline with air and break it up into minute particles. This drum is driven from the crankshaft of the engine, and is claimed to be capable of breaking up heavy oils.

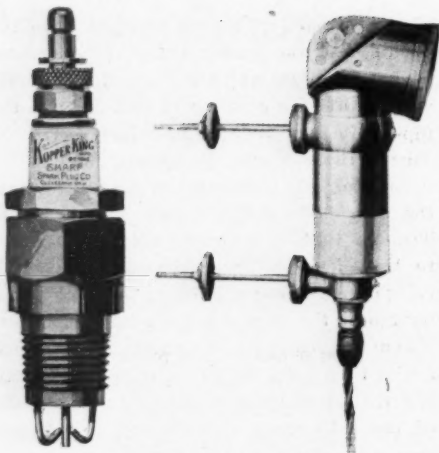
In the Kingston the ball type of auxiliary air valve is discontinued in the latest model, there being no auxiliary air valve used. Instead, there is a weighted valve in the mixing chamber between the nozzle and the throttle. Accordingly as the motor suction increases this valve is raised from its seat, increasing the air volume of the instrument.

#### Endless Variety of Accessories

In the miscellaneous accessory division there is an endless variety of things intended to make the problems of motor car operation and maintenance more simple. Heating devices are more expensively displayed and they



At the extreme left is a view of the Bosch magneto for twelve-cylinder power plants, in the center is the Bosch ignition apparatus for lights and at the right another view of the twelve-cylinder Bosch



At the left is the copper-treated spark plug known as Kopper-King and at the right is the Pittsburgh achromatic headlight

tend to be better in construction and methods of attachment. Various tire accessories, such as pressure gages, repair tools, and the like, reflect a more concentrated effort to reduce the motorist's tire troubles to the minimum. Batteries seem to be designed for the minimum of care with the greatest service possibilities, and while there is no perceptible change in the well-known makes of speedometers these all-important instruments have undergone internal refinements that have brought them to watch-like efficiency.

#### Bosch Twelve-Cylinder Magneto

The Bosch Magneto Co. is showing for the first time the Z-N 12, and also the Z-N 8, which are new designs particularly adapted for twelve- and eight-cylinder motors.

While the Bosch magnetos are entirely new they do not radically depart from previous Bosch design. The distinguishing features are the offset pole pieces and the novel arrangement of the high-tension distributor bridges. The series for eights and twelves is known as the Z-N and it very closely parallels the N-U series in that current is gathered on a slip ring in the rear of the instrument and carried forward by current bridges.

The distributor is double, as it has not been considered feasible to arrange the twelve distributor points around the circumference of one circle. Two distributor circles are used with the points so disposed that the current is taken ultimately from each. In carrying the current from the lip rings to the distributor the forward unit in the slip ring is connected with the high-tension bridge which passes directly through the center of the magneto. The current from the rear slip ring is taken by a cable which passes out around the side of the magneto to the exterior distributor. Of course, all this construction is within the magneto unit and is not visible on the exterior.

In order to take care of the current requirements of the twelve-cylinder magneto it is necessary that four sparks be produced in a revolution instead of two, as is ordinarily the case. This result has

been accomplished by the use of offset fields. The pole pieces are so arranged that instead of two current waves being created in a revolution there are four, the fields being in the form of a cross, so that at each quarter revolution the current attains its maximum.

#### K-W Magneto for Twelves

The K-W magneto for twelves is constructed along the same lines as the larger machines put out by this concern. In producing the ignition requirements for the twelve-cylinder motor four sparks are given in a revolution, due to the use of cross poles. The twelve-cylinder is driven at one and one-half crankshaft speed and the eight-cylinder at engine speed. The visible distributor is one of the interesting points of this magneto. The distributor box is provided with a mica cover which permits of observing the action of the distributor while the magneto is running. This instrument now is manufactured for two-, three-, four-, six-, eight-, ten- and twelve-cylinder engines, and it is provided either with or without the K-W impulse starter as desired. This impulse starter operates on a set figure arrangement which is released when the engine is cranked giving momentarily a high armature speed to create a good spark for starting.

#### Heinze Type for Eights

Heinze magnetos are now made in eight-cylinder units under the model name of Bx-8. With these magnetos two ignition sparks are produced during each revolution of the armature. The eight-cylinder magneto does not vary from the regular Heinze product except in the number of distributor points. The magneto is featured by the round section magnets and the round armature. The object of using the circular construction is to permit of the minimum amount of wire length in the primary and secondary circuits in order to cut down internal resistance.

A new concern known as the Price Co. is showing a combined ignition, lighting and starting unit which promises to be of interest as the unit not only includes the lighting outfit and generator parts, but also the breaker mechanism, high-tension distributor, coil and condenser. These are combined in a compact unit which weighs comparatively little in consideration of the large number of functions taken care of.

#### Westinghouse Has New Things

Several new developments are noted in the Westinghouse line. A mercury arc rectifier for charging one to six lead cells is shown; it will charge one six-cell 12-volt battery or one or two, three-cell 6-volt batteries. It is designed for a 110-volt, 60-cycle current and has an efficiency of about 55 per cent. The feature in the device is that no change in connections is required for charging different batteries. It is compact, measuring about 10 inches inside and is provided with a metal perforated cover which protects it against

injury. It is light and easily portable, and is suitable for private garages and small public ones. Price, \$25.

Fuse boxes for three and four circuits made out of porcelain instead of bakelite are exhibited, and ignition wiring ducts made out of micarta are shown. These are of various shapes and styles. A new line of 2-inch indicators for showing either voltage or amperage have been brought out for use on cowl boards. There is a new portable ammeter and voltmeter combined in one case that is made especially for testing starting and lighting circuits. The instrument is furnished with a leather case which contains the necessary ammeter shunts, wiring and connectors.

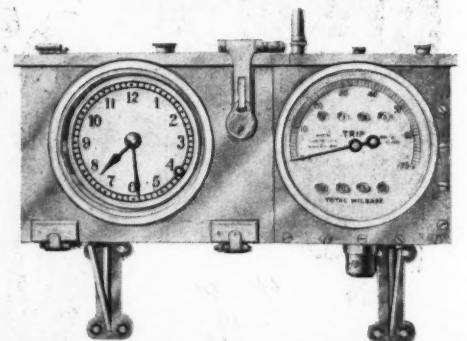
A case made of hand-sewed leather and to hold two head and side lamps and one tail and dash lamp is shown by the Perkins-Campbell Co., Cincinnati, O.

#### Mosler Ramrod Priming Plug

A. R. Mosler & Co., Mt. Vernon, N. Y., offers a new and interesting departure in priming plug construction in that the liquid is introduced by removing the central electrode. The electrode is normally fastened securely in place by two lugs which engage suitable grooves in the top of the spark plug, and the two parts are locked together by a concealed spring. It is only an instant's work to remove or replace the electrode since only a quarter turn is required to perform the operation. The metal part at the top of the spark plug is cupped to facilitate priming. The demountable feature also facilitates cleaning and inspection of the plug points. Leakage between rod and spark plug are prevented by a ground conical joint between the two, the former being provided with a shoulder for this reason. It is made in all standard sizes at \$1, and special models are made for Overland, Reo and Buick.

#### Master Spark Plug

The Hartford Machine Screw Co., Hartford, Conn., has a new spark plug that has a calorite insulator in place of a porcelain; otherwise the plug is unchanged. The particular features claimed for the new material, which is a special composition resembling porcelain, is that it will withstand extreme temperature changes and a greater voltage. It can be heated white hot and then plunged into cold water repeatedly without coming to any harm, it is



Centrifugally acting speedometer and speed recording clock

said. It will stand 10 per cent greater voltage than the best porcelain insulators, it is claimed.

#### Standard Speedometer

The Standard Thermometer Co., Boston, Mass., shows some new features in the product, the most important of which is a centrifugal type speedometer for flush cowl mounting yet without the angle joint. The driving cable goes directly into the back at right angles to it. The new swivel joint is a double bevel gear arrangement in which the adjustment of the gears may be brought within .002 inch of the best adjustment. This detail is provided for by having a fine-threaded adjusting nut for each bevel set, and a means for locking at several positions per revolution.

#### Ever Ready Starter for Fords

The American Every Ready Works, New York, has a single-unit starting and lighting system developed for Fords. It is mounted at the front taking the place of the crank, and is a neat cylindrical shape. As a generator, it is driven directly through the crankshaft gears and supplies the battery with a 6-volt current. When operating as a starting motor it works through a gear reduction and draws a 12-volt current. The battery is a flat, thin type which is placed against the front seat, and at the left side within easy reach of the driver is the light-controlling switch. The starting switch is mounted on the spark lever bracket and is so connected that when the lever is retarded the maximum the circuit is closed and cranking begins.

#### Campbell Latigo Fan Belt

The reinforced Latigo fan belt, made by the Perkins-Campbell Co., Cincinnati, O., is an endless combination construction brought out as a running mate to the Latigo belt. It is made by taking high-grade webbing putting it under strain for 24 hours to remove the stretch and then this is cemented to Latigo leather which has also had the stretch removed. The purpose of this process is to provide a belt that will be impervious to heat, oil and water and will not slip. It is made in sizes to fit any car and may also be had in 10, 25 and 50-foot lengths. Price 30 cents.

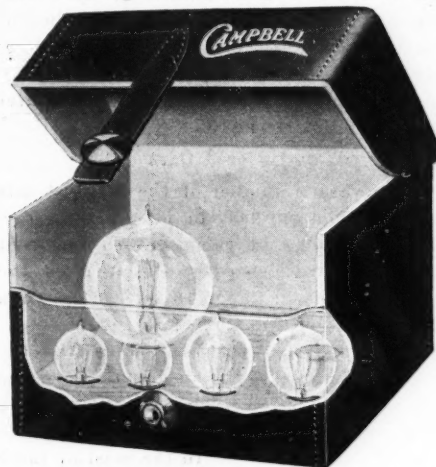
#### Copper-Treated Plug Shell

The Kopper King spark plug is a product of the Sharp Spark Plug Co., Cleveland, and while its design is more or less conventional, it is unusual in that the shell is of copper-treated steel. The metals are brought together at a high temperature and the combination produced a shell that will not rust or stick, that has the strength of steel—and that is decidedly attractive in appearance. The hole of the central rod and both of the small electrodes are of Monel metal. All threads and sizes are made, including the various extension types, and all sell for \$1.

#### Waltham Clock Models

There are two new models of Waltham clocks made by the Waltham Watch Co., Waltham, Mass., types F and K. Both

are for cowl mounting, the former being a double telescope type which is thinner and more compact than the single telescope design brought out last year. The telescope feature is for winding as the clock sets flush with the cowl with only the bezel showing, but when it is to be wound it is given a quarter turn and pulled out about 1½ inches, exposing the winding key. In this position the clock may be rotated in any direction so that the most convenient position for winding may be obtained. The type K is also a flush mounting, but the winding stem is extended so that the knob for winding and setting extends to the



The Campbell lamp case that holds head, side, tail and dash lights



Campbell Latigo fan belt

lower edge of the cowl. This design has the advantage of neatness and maximum convenience. The price of either type is \$25, and they are furnished in all sizes and styles of cases and finishes.

#### Stewart Horn Prices Lower

The prices of Stewart hand- and motor-driven horns have been reduced for 1916. The 1916 line consists of one motor-driven type for either direct or alternating current with different motors for 6, 12, 18 and 24 volts. The standard model with 6-volt motor sells for \$6—the former price was \$10—complete with cord and push button. Stewart hand horns are offered in models for passenger cars, motor trucks and motorcycles. Each follows the same principle of design, although naturally different in strength and size. Each is operated through a vertical rack plunger which vibrates a metal diaphragm through a train of gears.

#### Pittsburgh Achromatic Headlight

The Pittsburgh achromatic headlight made by the Pittsburgh Electric Specialties Co., Pittsburgh, Pa., is a development of the Roffy-Grace and is designed for mounting on the radiator. The lens construction is such that the light is concentrated on the road and no rays can be emitted at a greater angle than the horizontal. Light for city driving is obtained

through the illumination of the semi-transparent tubes at the bottom of the light.

#### Long Horn New Type

One new model of Long hand horn was shown for the first time at the booth of the Edward A. Cassidy Co., New York. Like the other two models carried over from last year, without change, the new model is also hand-driven, but by a cable instead of a ratchet plunger. The new model is designed especially for use under the hood of a car. It is operated by means of a two-part cable, that is, one within the other, one end of which is attached to the regular ratchet of the device and the other to a lever in a small box to be placed convenient to the driver's hand. When the lever is pushed in one direction it shortens the distance between the points of attachment of the inner cable, thus causing the ratchet to move and set the rotor in motion as in the regular manner. In this operation, the length of the outside cable, which is connected to the horn proper by a universal, remains constant and simply serves as a container for the inner one. In other respects the horn is identical in design with the other two Long models.

#### Wandertone Hand Horn

The first time shown, the Wandertone hand horn, made in but one size and sold by the Motor Appurtenances Corp., New York, is of the ratchet type but differs from others of this design in that the rotor is not placed perpendicular to the vibrating button on the diaphragm, but at an angle to the latter. This construction permits the ratchet handle to be placed on the centerline of the horn, thus making it equally suitable for vehicles with either left or right steer. The ratchet drives the rotor shaft direct without the use of any intermediate gears. The Wandertone horn is made in several different finishes to suit the taste of the purchaser and retails at \$3.

#### Klaxon Hand and Motor Horns

Five new models of Klaxon motor vehicle horns are exhibited. They are all of the motor-driven type and differ from the previous forms in that the L construction in which the motor is placed at right angles to the centerline of the horn proper has been abandoned and the motor placed at the rear on the centerline, making a more compact unit. The prices of the old models carried over have not been changed.

The new models are known as UH Klaxon with straight-sided projector, selling at \$12 list, and UH Klaxet with bell projector at \$6. Three short-length projector motor-driven horns complete the newcomers. No change has been made from previous Klaxon design in the method of sound propagation. Klaxon horns are now offered in twenty-two models for motor vehicles and four for fire signal work.

#### MAXWELL TRAVELS 21,062 MILES

Los Angeles, Cal., Jan. 3—Special telegram—At 4 o'clock this afternoon, the Maxwell, which established the world's non-motor-stop record for stock cars recently and still is running, had covered 21,062.4 miles.

## Few Foreign Exhibits

Majority of Cars at Gotham Salon Bear Made in U. S. A. Trade Mark

Distinctive Body Styles Feature Show at Hotel Astor

NEW YORK, Jan. 3—Special telegram—War has placed its iron hand on the annual exhibition of foreign cars at the Hotel Astor which for many years has been a feature of show week in New York. No longer is it really an exhibit of European handiwork and design. It even has been changed in name; this year it is the Automobile Salon, not the Importers Automobile Salon.

The show is preponderantly American, not only in body styles, but also in chassis as well. In previous years, importers of European cars and chassis have held the floor exclusively at the salon, while the American cars were on display at the Grand Central Palace, or the old Madison Square Garden. There always have been American-built bodies shown, but almost always on foreign chassis. This year American cars and American chassis are in the majority. There were not enough foreign products available to make a representative showing.

### Fifty Cars Shown

Of the fifty cars on display, thirty-four are American and only sixteen have foreign-built chassis. There are only five European factories represented, while double that number of American name-plates are to be seen. Most of the foreign motors are fitted with American-built bodies and are displayed by the body builders.

The European chassis on exhibition consist of the Peugeot, Rolls-Royce, Lancia, Daimler and Delaunay-Belleville.

Of the American cars the White company has the most complete exhibit, as the concern is confining its display to the salon and is not represented in the Grand Central Palace. Singer, Daniels, F. R. P., Simplex-Crane and Brewster are American products whose efforts are concentrated at the Astor. The other American cars to be seen are Locomobile, Cadillac, Packard and Owen Magnetic. These are employed as settings for the special bodies exhibited by the body makers.

Locomobiles show the handiwork of Healy & Co., though the designs are by De Causse, manager of the Locomobile company's custom body department who formerly was with Kellner, of Paris. Schuette uses Rolls-Royce as the setting for his body designs.

Holbrook bodies are shown on Cadillac, Packard and White chassis. Brewster bodies are shown on Rolls-Royce and Delaunay-Belleville running gears. Brewster also is unveiling a new Knight-engined chassis of the body makers' own design.

Simplex-Crane, F. R. P. and Daniels are making their debut at the salon.

Only one real attempt at stage setting is to be found at this salon. At the Owen Magnetic booth, two very correctly uniformed footmen stand like statues with robes over arm, and neat steps to the running boards are provided to make entrance easy to the vehicles.

The salon this year is a study in bodies, for it is here that the custom-made superstructures are found. From inspection of these it is evident that the very latest in body design incorporates slanting V-shaped glass fronts and windshields, lower inclosed cars, steps instead of running boards on the sportier types, fewer cowl instrument boards, the striped effect in upholstery and seat covers, and much greater convertibility of body.

### Low Types of Inclosed Cars

There are a number of the inclosed cars which are much less in height than previously. Some of them are so low that the roofs are not over 6 feet from the ground. This is 12 or 18 inches less than we have been accustomed to seeing.

It is in the convertible bodies that the greatest effort of the designers seems to have been exerted. The majority of the cars are of the semi-touring, semi-limousine or cabriolet type. In the most of these there is an unusual expanse of glass, all of which disappear into the sides of the body. In some designs the top itself is permanent, but more often this also folds back, landaulet style, to make a completely open vehicle. In one of those in which the tops are permanent, the latter is almost entirely of glass, a horizontal curtain coming into use when inclosure is desired. The inclosed cars at the salon look more practical than do those of that type at the Palace. There is less of the special show fittings in the way of lace curtains and ribbons.

### MITCHELL-LEWIS FOUNDER DEAD

Racine, Wis., Jan. 3—William Turnor Lewis, second vice-president of the Mitchell-Lewis Motor Co., Racine, Wis., one of the founders and principal stockholders in the concern, died suddenly, December 30, at his home, from apoplexy. Mr. Lewis was born in Utica, N. Y., March 10, 1840. His first occupation was that of a telegrapher and he served through the civil war as a military operator. In 1864 he married Miss Mary Mitchell, daughter of Henry Mitchell, the first wagon manufacturer in the northwest and founder of the business which in later years became the \$10,000,000 Mitchell-Lewis Motor Co. When the present concern was organized, Mr. Lewis preferred to take a post of lesser importance and made his son, Captain William Mitchell Lewis, president. However, Mr. Lewis took an active interest in the affairs of the company until the day of his death. He served two terms as a state senator and once was a popular choice for the nomination for United States senator.

## One Tire Price Raised

Kelly-Springfield Sets Pace That Other Makers Are Expected to Follow Soon

Increase in Cost of Crude Rubber Causes Revision of Lists

NEW YORK, Jan. 4—The anticipated increase in the price of pneumatic tires, which was expected to be announced by nearly all of the tire manufacturers January 1 has been announced by only one concern, Kelly-Springfield whose new prices represent an increase ranging from 7½ per cent on the smaller sizes such as 30 by 3 to approximately 26 per cent on such sizes as 37 by 5.

Although none of the other companies has given any intimation of a rise it is generally rumored in tire circles that one will come January 8. The present rise is due entirely to increased price of rubber which has risen from 57 cents a pound in September and October to \$1.05 yesterday.

The rise in price, which has been going on steadily since November 1, started with the reported closing of the Suez canal and although this great waterway, through which comes all of the crude from the Federated Malay states and Ceylon, has not been closed, the rubber price nevertheless has continued to rise. That a rise was imminent was rumored recently.

To date only one boat, carrying rubber from the east, has been torpedoed, this being the Lagoon Hall with 500 tons of crude, which was destroyed early in December. This loss is not sufficient to create any increase in price.

### CLEVELAND CARS TO TOTAL 60,000

Cleveland, O., Jan. 4—In an article published recently, the Cleveland Plain Dealer estimates that the output of the motor car factories here for 1916 will be at least \$69,000,000. To reach this sum, it placed the number of cars for all the factories at 60,000 and assumed that \$1,150 would be the average price.

Its estimate for the value of parts and accessories, including motors and batteries, for 1916 is \$81,000,000, making the total valuation of the output for the year \$150,000,000. It is assumed, also, that the White Co., the Peerless Motor Car Co. and the Baker R. & L. Co., all of which have taken in new interests, will have a greater output than at any time in the past. The H. A. Lozier Co., only recently incorporated, will have cars ready for delivery in March, it is said.

The Winton Motor Carriage Co. and the F. B. Stearns Co. are the other two companies in this city. Both have a large output and their cars sell well above the average taken in reaching the figures given.



## When the French Soldier Flees from Range of Guns

### Motor Truck Convoy Carries Troops from Trenches for Short Furlough of Rest at the Rear

PARIS, Dec. 16—When the period of duty in the trenches has come to an end, the French soldiers are marched a few hundred yards to the rear, where on a sheltered road they find a number of motor trucks waiting for them. The trucks may be American machines—Whites, Packards, Pierce, Kelly, or Jeffery—or as in the case illustrated, they may be French camions which changed a year and a half ago from civil service to war and have been at war ever since. The men form in groups of half sections at the rear of each truck and wait the order to get aboard. Sufficient space is left at the rear of the trucks for the men to form.

On a signal given by whistle, thirty-five mud-stained troopers scramble into each truck, place themselves on the temporary transverse seats, and a few seconds later, as the result of another call by whistle, the convoy moves off. This procession of trucks, which only an hour before had brought up a supply of fresh men, travels about 10 miles to the rear, where in comfortably installed quarters, each man can get rid of the dirt he has gathered during his period of service in the trenches and pass a quiet week or so in preparation for more active duty.

The trucks are an interesting study. Those shown in the illustration are an old type, for they have rear wheels with steel tires, an equipment which was abolished 2 or 3 years ago. They have been taken direct from private service, and have not been back to the repair shop for any lengthy stay, for they still carry the name of the original owner, and it is the rule to paint out such names when a truck is overhauled. The individual drivers have built up the sides of the cab to give more protection against the weather and have added a swinging windscreen and leather apron from the extension top to the dashboard.

Many of the trucks look as if a theatrical scenery artist had been working on them in his spare time, for they have been given a ground color of grey and then daubed with every color of the rainbow,

so that at a distance they give the impression of a group of rocks or a mass of vegetation. Broken colors are much more difficult to pick out of the surrounding landscape, when viewed from a distance, than a uniform mass.

It will be found that most of the trucks carry a couple of hammocks stuffed with hay, attached to the top of the canvas hood. The driver and his mate have found by experience that whenever a new town is struck, the few beds have been secured in advance and that the best corners in the barns are somebody's reservations. Under such circumstances it is convenient to be able to pull down the hammocks, carefully attach the canvas top of the car, and sleep aboard. The outside "walls" are apt to let in a certain amount of cold, but with plenty of wraps, sleep is not likely to be curtailed on this account.

#### U. S. CARS WIN OVER EUROPE

Detroit, Mich., Jan. 4—The American-made motor vehicle, passenger car and truck, has been vindicated in the eyes of the British and French, and is now recognized on its full merits. This is the opinion of E. W. Davenport, export manager of the Maxwell Motor Co., who has just returned from a 10-weeks' stay in England and France.

"If this war brings about no other changes in old Europe, it will surely have been the means to cause the disappearance of much of the old prejudice against American motor cars," said Mr. Davenport.

"Now that American passenger cars and trucks have been used by both France and England on the battlefield, or far from them but performing heavy road work wherever they were and are used, it is the opinion of those competent to judge, that the cars made in the United States have and are continuing to show up splendidly. They are, in fact, one of the surprises of the war. Hardly anybody in Europe thought that they could ever work or perform their duty as they have.

"There never has been a more severe testing ground for motor cars and as a

result it is certain that several changes will be made on American cars and trucks. They will, however, all be of a minor character, as there is nothing of an essential nature in our cars or trucks which has been found to be wrong for use in Europe.

"One of the results of the splendid showing of the American cars probably will be that European car makers will adopt the American idea of quantity production as it has not yet been attempted in Europe. There will probably be several mergers of concerns, as well as new concerns with much larger capital than now. New cars will be brought out to compete with the American moderate price cars, and they will probably be of a quality, both as to material and workmanship never before to be had at a low price.

"Although traveling, both in England and France, is by no means as pleasant as under normal conditions, I did not have any difficulty anywhere. In fact, I found both British and Frenchmen most desirous of co-operating in making traveling as agreeable as possible. While you have to submit to some inconveniences, this is only natural in times of war. However it depends a great deal upon yourself whether you have little trouble or much inconvenience. If you show readiness to answer all questions and go by the rules and regulations, you will encounter only gentlemen who treat you as a gentleman. But, if you argue, if you attempt to evade questions put to you by the authorities, if you fail to report to the police headquarters or the government office as the law requires, then you are handled a la militaire, without gloves, and this is your own fault.

#### CARS FOR CHRISTMAS GIFTS

Des Moines, Ia., Jan. 3—Motor cars were extensively purchased in Iowa as Christmas gifts, according to W. S. Allan, secretary of state, who reports the registration of 5,000 new cars during the holiday period many of which were stated to be Christmas gifts. A total of 100 new cars were registered during the holidays from Des Moines alone.

# Lewis-Clarke Road New Project

## Transcontinental Highway to Extend 3,522 Miles from Savannah to Seattle

OMAHA, NEB., Jan. 4.—At a convention to be held in Omaha during February, a new transcontinental highway connecting Savannah and Seattle will be formally launched. Invitations to the pivotal cities along the route to send two delegates each to this convention were issued by the Omaha Commercial Club and the Omaha Automobile Club, meeting in joint session here today.

Almost as short as the shortest transcontinental route thus far laid out, yet connecting sections of the country heretofore apparently considered isolated from each other, so far as the motorist is concerned, this proposed highway bears the unique distinction of requiring little if any building, as it follows almost throughout its length one or another of the roads already developed. Because of the fact that it leads to the great northwest, it has been aptly suggested that it be christened the Lewis and Clark highway, in honor of the intrepid explorers who brought the light of civilization to this territory a century ago.

### Road Measures 3,522 Miles

Although it connects opposite corners of the country, the length of this proposed highway is only 3,522.4 miles, which compares very favorably with the 3,384 miles of the Lincoln highway. Besides this, there are many places along the proposed route where optional routes may be taken by the tourist, with little or no

variation in the car's speedometer reading.

Special emphasis in this project is laid on the fact that there is involved practically no road-building, as the route follows well-chosen roads already known and developed by their respective sections, and thus no suspicion of exploitation can be laid at the door of its promoters. The sole idea of the plan is to show the way to the motorist of going by the most desirable route from the southeast to the northwest, or vice versa.

The road as planned starts at Savannah, Ga., and leads through all the principal cities of the central valley and the northwestern states.

From Savannah to Cape Girardeau the route follows colonial and sectional trails well laid out and thoroughly seasoned. Between Atlanta and Decatur the route is optional via Chattanooga or Birmingham, and there is also a choice of roads from Memphis to Cape Girardeau, from which point to St. Louis the established river road is followed. From St. Louis to Kansas City the old Santa Fe trail, called by motorists the National Old Trails road, is the route, while the Omaha-Kansas City route along the Missouri river connects the points after which it has been named.

Another choice of roads is given from Omaha to Sioux City, one on either side of the Missouri, and the choice may be followed even to Sioux Falls. From this

point on, the route follows the scenic highway across South Dakota and the Black Hills to Cody, Wyo. Here again the motorist is offered the choice of trails. He may proceed straight ahead through Yellowstone National park, thence north through Gardiner to Livingston, Mont., or he may go via Billings from Cody to Livingston, and take the park tour if he so chooses on the return trip. From Billings the route follows the National Parks highway to Missoula, Spokane and Seattle, on the last leg of which there is a particularly fine boulevard road.

### Crosses Other Main Highways

Another feature of the new route is the fact that it crosses every other transcontinental highway. Thus, if the traveler wishes, he may deviate from his original itinerary almost at will, and find himself on a highway that will lead him to whatever section he may choose to go.

The meeting today resulted in the two clubs sending their invitations to corresponding clubs in the pivotal cities along the proposed route, asking the commercial club and the motor club at each place to send a delegate to the Omaha convention. The body thus formed will elect one representative of each place as a vice president of the association. These men will then decide so far as may be practicable from the pivotal cities the details of the best route along the general principles as already outlined.

The second convention then will be called, the delegates to which will be representatives of every city along the proposed route. This final convention, which probably will be held early in the summer, is expected to decide finally all points arising under the optional route provision, and where the delegates individually cannot come to an agreement, the body as a whole is expected to decide the matter.

The pivotal cities already named are Savannah, Atlanta, Decatur, Memphis, Cape Girardeau, St. Louis, Kansas City, Mo., Atchison, Omaha, Sioux City, Sioux Falls, Deadwood, Cody, Butte, Spokane and Seattle. The exact time for the convention has not yet been determined, but it is desired to give the delegates time to consider the matter before leaving home, and to discuss it at length.

### PLAN DETROIT-CHICAGO ROAD

Battle Creek, Mich., Jan. 3.—Detroit and Chicago are to be joined by a paved highway if plans being discussed by the Michigan Detroit-Chicago Highway Association are brought to fruition. A preliminary meeting of those interested in the road was held in this city last month, and an organization was perfected. A. B. Williams was made president of the association and a second meeting will be held here this week for further discussion of the project. The mayors of Detroit, Chicago and the intervening cities, members of business organizations, motorists and newspaper men have been invited to attend the



MOTOR TRAFFIC IN NEW YORK DAY BEFORE CHRISTMAS

So many cars followed George M. Cohan's song advice and "gave their regards to Forty-second street" that they were parked two deep in the shopping district

meeting and more than 300 are expected to be present. The new highway will be a paved road connecting Detroit and Chicago and running through Ypsilanti, Ann Arbor, Jackson, Battle Creek, Kalamazoo, and other Michigan towns. It will be about 300 miles in length and will follow, for the most part, the line of the old territorial road by which the early Michigan and Illinois pioneers came into the lake section from the older states.

#### ROAD BOND ISSUE UPHELD

Bloomington, Ill., Jan. 3—Illinois has taken a long step out of the sticky mud that has been the disgrace of the sucker state since it first commenced to rank with the wealthier states of the middle west. This lengthy progressive movement was brought about by the decision of the supreme court in upholding a bond issue of \$1,500,000, voted by the board of supervisors of Vermillion county, to produce a system of good roads in that district. The finding of the upper court had been awaited with intense interest, not only by the citizens of Vermillion county, but by the entire state. A reverse decision meant the death knell of the good roads movement for many years to come. Twenty counties either have taken the same action as Vermillion or are ready to do so and simply held back until they learned the ruling of the supreme jurists. Now that the way has been cleared, probably for all time to come, the movement for better highways, so long delayed and blocked by various obstacles, will progress by leaps and bounds.

#### MOTORIZED MOONSHINER KILLED

Montgomery, Ala., Jan. 5—In characteristic fashion, M. J. Rambo, known to revenue officers as the "motorized moonshiner," met his death a few days ago, in Covington county, Ala. Rambo was accustomed to remove his illicitly manufactured whisky from his still by motor car and had succeeded in evading the officers for some time. On his last trip, however, he overloaded the car and it broke down on the road. Revenue officers came upon him near his still. Rambo opened fire and wounded one of the deputies. A fusillade of shots followed and Rambo was killed.

#### SCHEDULE JULY 4 RACE MEET

Spokane, Wash., Jan. 3—Guy E. Reigel, of Spokane, manager of the Seven-Seven Co., Dodge distributor for eastern Washington, and Robert A. Huller, of Seattle, who for the past 2 years has been the manager and promoter of the Northwest Automobile Association, have secured a lease on the Coeur d'Alene mile race track for races on July 4. The Coeur d'Alene track is midway between Spokane, Wash., and Coeur d'Alene, Idaho and is one of the best mile courses in the West. The turns are to be banked early in the spring and everything put in the best condition for a first-class meet.



BRAND WHITLOCK AND HIS CAR POSE FOR THE MOVIES

On his recent visit to the United States our ambassador to Belgium rode from Washington to Toledo, his home city, in an Overland

## War Creates Army of Tungsten Gleaners Rock, Once Regarded as Worthless, Now Eagerly Sought in the Rocky Mountains

**B**OULDER, Colo., Jan. 3—Fortunes are being picked up on the hills of Colorado as a result of the increased building of motor cars. A new industry has sprung up here, one that requires no capital except labor and returns big profits for the lucky.

The industry is that of gathering tungsten, a mineral used in certain processes of hardening steel for use in manufacturing axles, cams, and other parts of motor cars. The tungsten is picked up from the ground in pieces ranging from the size of a man's thumb to large boulders and practically all the citizens of this and other counties are interested in combing the rocky hills for this mineral.

Before the European war began, Germany supplied the world with tungsten, with the exception of some being produced in Idaho, but since then prices have jumped by leaps and bounds until recently it was commanding \$2.50 a pound, with possibilities of further advances. With such prices, it became profitable to pick up the tungsten pieces that hitherto had been considered as so much worthless rock.

The tungsten gleaners go out with sacks on their shoulders and pick up the mineral just as the gleaners of grain did in the old Biblical stories. Men, women and children are engaged in it and reports are current of small fortunes having been garnered by the lucky gleaners. One tells of a girl who was unable to purchase a fine trousseau such as she wished. Her father refused the money for it. So, she took a sack, went after tungsten, and, in a few days, was able to buy one of the finest sets of wedding clothes seen in Boulder county. Another tells of a dep-

uty sheriff who has averaged nearly \$1,000 a month by gathering the mineral after his regular duties had been performed.

Mining has opened extensively. Some old prospectors have given up the search for gold to prospect for tungsten and have staked out claims. Some government land, hitherto considered worthless, has been pre-empted for mining purposes.

#### COLORADO AFTER WINTER TOURISTS

Denver, Colo., Jan. 4—To increase interest in winter motoring and winter buying of cars, the members of the Automobile Trades Association of Colorado are sending out 60,000 attractive mountain driving stickers on their mail. This is the only plan taken up here thus far in an organized way to push winter business, although some individual dealers are making special test trips into the foothills and otherwise making extra efforts to keep the buying and constant driving idea before the public. The 65-mile run of 500 cars conducted by the Denver Motor Club through the city's municipal mountain park system in the foothills the middle of this month has helped the motor car business considerably, and some dealers are urging a winter show to push sales while prompt deliveries are easy to make. No definite action has been taken toward a show, however, and some of the dealers feel that the expense would not be justified within such a short time after the fall show in October in connection with the International Soil Products Exposition, in which a goodly number of dealers exhibited.



# Chug Chug Chug the boys are driv-ing

LOS ANGELES, Cal., Jan. 3—California now has a perfect military highway stretching down the coast from Los Angeles to San Diego. It is the southern end of the new state highway, built over what was once the El Camino Real. With the completion of the southern end of the state highway, 132 miles of concrete join the two southern California cities and in case of war, this piece of excellent road would be of great value to the government, according to military experts.

What is claimed to be the greatest motorized military demonstration ever staged, was successfully carried out recently by a fleet of Moreland distillate burning motor trucks over the state highway from Los Angeles to the southern exposition city. At a cost of  $\frac{1}{4}$  of a cent per ton mile, a complete field battery was transported to San Diego and return by five motor trucks.

## Run Under Army Supervision

The run was made under the supervision of Colonel C. A. Gresham, U. S. A., and Captain Jesse McComas, N. G. C., was in command of the battery. The adjutant general appointed Lieutenant Sterling S. Boothe, N. G. C., official military observer and ordered him to attend the novel demonstration.

The trucks and drivers were furnished by Watt L. Moreland, manager of the Moreland factory and pioneer military motor transportation expert of the Pacific coast. Moreland is one of the most patriotic citizens in the state and is a private in the Los Angeles motor reserve, the first organized motor reserve corps in America, which now is prepared to take the field on short notice. The drivers also were members of the motor reserve who volunteered their services for the hard run down the coast and back.

In addition to furnishing the trucks, Moreland entertained the officers, drivers and enlisted men of Battery "A," First California Field Artillery, at a San Diego hotel. The state having spent its entire appropriation, there were no funds available for the military work and Moreland relieved the situation by renting an entire floor in a hotel and arranging with the manager for the meals of the officers and men.

The rations for the run down and back were supplied by C. Fred Harlow, a military enthusiast of Los Angeles. While the tour was a maneuver de luxe for the men, it was of great benefit to the military service and many lessons were learned.

The southern trip was made in 7 hours' running time and the return run was completed in less than 8 hours on the road.

## TABULATED COST OF MOTORIZED BATTERY RUN TO SAN DIEGO AND RETURN

Four drivers .....	\$28.00
133 $\frac{1}{2}$ gallons distillate, four trucks .....	10.60
4 $\frac{1}{2}$ gallons oil .....	1.68
9 pounds grease .....	.54
5 quarts kerosene .....	.12
	<b>\$40.94</b>
Miles, each truck .....	268
Total miles, four trucks .....	1072
Miles per gallon distillate .....	8.03
Miles per gallon oil .....	236.0
Total tonnage, guns towed .....	16 tons
Cost per ton mile .....	$\frac{1}{4}$ c

Both going and coming, the battery was halted on the highway above Oceanside and both the president's and the governor's salutes were fired. On the return trip, several hours were spent maneuvering with the 3-inch guns in the broken country above the beautiful seaside city, La Jolla.

The trucks used were 2  $\frac{1}{2}$ -ton, worm-drive Morelands. A light 1-ton truck went ahead of the main body with a party of artillery officers and made the 132-mile run in 4 hours and 12 minutes. In addition to twenty men per truck, a 3-inch field piece and cassion was trailed by each one. On one 2  $\frac{1}{2}$ -ton truck, the battery wagon, loaded with shells and parts for the guns, weighing more than 4 tons, was hauled and the gun and cassion was trailed as well. This was the greatest feat of all. Averaging 20 miles per hour, this great load was carried down the El Camino Real with but one stop.

## State Road Military Asset

Colonel Gresham said after the run that the state highway would undoubtedly be of great military value in time of war but believed that it would be better suited to military usage if it were built behind the first range of hills. The colonel, who is an old cavalry officer, said that it was amazing to him to see four trucks take the place of fifty horses and make more distance in 1 hour and 30 minutes than the battery could in 24 hours under horse power.

At the end of the run, the axles and steel tired wheels on the guns showed no damage done by the strenuous trip. When the battery stopped, a sergeant of artillery, detailed from the regular army as an instructor at the Los Angeles armory, examined the axles. Oil was used in great quantities to keep the old fashioned axles from heating.

The regulation speed of a 3-inch gun being not more than 4 miles an hour, it was a great strain on the gun carriages to make 20 and in some places as high as 30 miles per hour. The officers agreed that in the future, artillery should be mounted

on ball or roller bearings to provide for high speed work behind motor cars or trucks.

The tire problem is one of the most serious in connection with artillery transportation by motor truck. The steel tires jar the guns when high speed is made and in time would effect the shooting qualities of the field pieces. One proposed solution is two sets of wheels, one to be carried on the truck in a tire rack when not in use. The steel tires would be used in action under horse power while heavy solid rubber tires would be used on the road while under motor transportation.

One of the great benefits of motor transportation aside from the speed feature brought out on the artillery test was the fact that a battery of artillery could be rushed from Los Angeles to San Diego in 7 hours and with horses waiting at the end of the run, could go into action at once. If horses were used, it would require at least 2 days to make the run under extraordinary conditions and then the horses and men would be worn out before going into action. If the battery were shipped by train, it would require almost half the time to unload and load the equipment and horses as it took for the motorized battery to make the entire 132-mile dash.

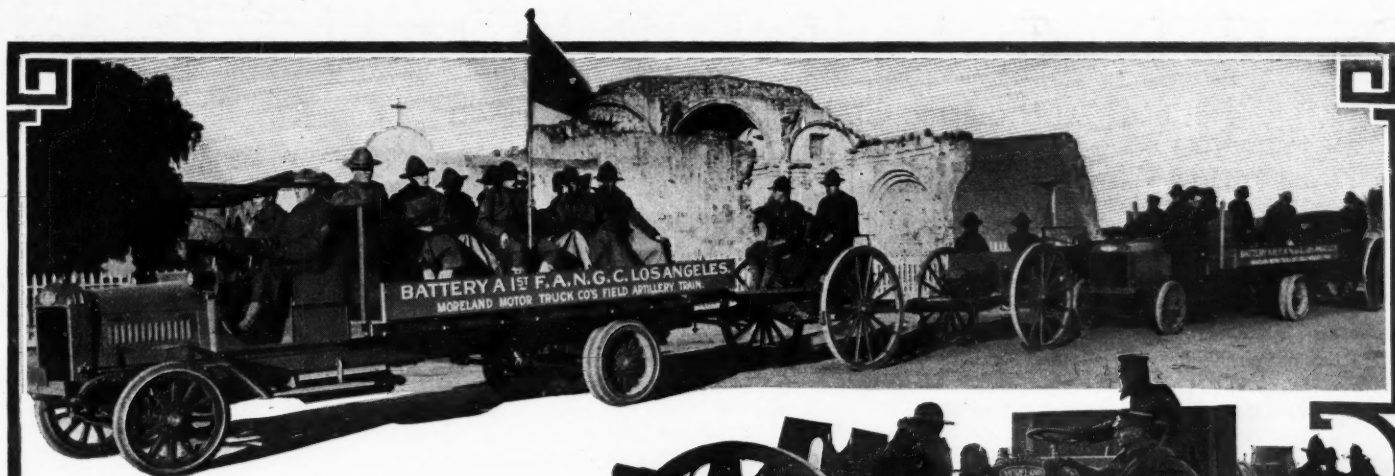
## ROUT MOTOR CAR THIEVES

Kansas City, Mo., Jan. 3—The recent formation of the Kansas City Anti-Motor Thief Association, combined with increased activity by the police, has reduced the number of motor car thefts here approximately 90 per cent. Reports made to Larry Ghent, chief of detectives, by the motor squad show that only five cars were stolen during the month of December. All of these were recovered. From October 15 to December 1, the report also shows that sixty-three cars were reported stolen and all except three of them were recovered.

The anti-motor thief association was organized on October 14 by members of the motor club, the commercial club, other civic bodies and car owners. Previous to its organization, owners were almost afraid to leave their cars standing for fear of crooks.

## PACKARD DECLARES NEW DIVIDEND

Detroit, Mich., Jan. 3—As a fitting climax to the ending of its busiest year since it was started, the Packard Motor Car Co. today announced that common stockholders will receive a 10 per cent stock dividend in addition to a cash dividend of 1  $\frac{3}{4}$  per cent. Payment will be made February 1 to holders of record January 15.



*Motor train of California's citizen-soldiers passing old San Juan Capistrano mission en route from Los Angeles to San Diego*



*Motor reserve corps' battery fires the president's salute of twenty-one guns over the Pacific from the El Camino Real at sunset*



*Above, on the new state highway near Anheim, Cal., and at left, mayor, of Los Angeles, chief of police and prominent citizens inspect corps before start of trip*

## California, First in Motor Preparedness, Sees Los Angeles Motor Reserve Corps in Trip from Los Angeles to San Diego and Return

# Demand for Gasoline Price Probe Made in Congress

## Federal Authorities Claim That 1915 Production Was Greater Than in Two Previous Years

WASHINGTON, D. C., Jan. 4—Special telegram—The attention of congress was directed to the high price of gasoline today, when Congressman Steenerson of Minnesota introduced a resolution calling upon department of justice to advise whether it has begun prosecutions against those responsible for the increased prices.

The preamble of the Steenerson resolution asserts that present price of gasoline is "unreasonable and extortionate" and that it is sufficiently high to injure the industries of United States, particularly the farming industry.

The resolution directs the attorney general to advise what steps he is taking in connection with reports that dealers in the commodity are violating the Sherman anti-trust law. If the department has not begun prosecution, the resolution provides that the attorney general shall explain why such prosecutions have not been started and if they are contemplated.

The Steenerson resolution was referred to the judiciary committee.

"We will answer the resolution when it comes to us," said Assistant Attorney Todd this afternoon when advised of Congressman Steenerson's action in the house. Asked if any prosecutions had been started or steps in that direction taken, Todd, who would inaugurate such prosecutions, said:

"It would be improper for the department to answer the resolution before it is received here, and through other than the official channels."

It is known, however, that the department of justice has been making investigations into the price of gasoline, particularly in localities where the company which raised the price has no competition. It is understood the department has been co-operating with the Federal Trade Commission in the matter, and that the reply to the Steenerson resolution will show that considerable progress has been made in the inquiry.

### PRODUCTION RETARDED

Washington, D. C., Jan. 3—With both the department of justice and the federal trade commission preparing to investigate gasoline prices and with the probability that congress will also take a hand in the matter, the subject is sure to receive a lot of attention during the next few weeks.

Official government figures just made public disclosed that in the face of rising prices of gasoline, production of crude petroleum during the last year was greater than in 1914, although production was "purposely retarded as far as practicable"; that reserve stocks of crude petroleum now being held in the country are the

largest ever recorded; and that exports of gasoline, to which the rise in prices frequently has been attributed, were in the last 10 months of 1915 less than the exports during the corresponding periods of the 2 years previous.

A statement issued by the geological survey estimated the 1915 production of market petroleum at 267,400,000 barrels, 2,000 barrels more than in 1914. "This," says the statement, "does not agree with the currently reported reason for the exceptionally high prices now prevailing for motor fuel. As a result of the overload put on the transporting and refining phases of the petroleum industry by the excess output of 1914, the year 1915 may be characterized as a period of readjustment, in which production activity was purposely retarded as far as practicable. The small increase, therefore, is more significant than the simple figures indicate."

### Large Reserve Stock Held

Factors that might be expected to affect the price of gasoline, according to the survey officials are production, consumption and prices of crude petroleum. Consumption figures, they said, were not available, though consumption was increasing. A low petroleum price level was reached in April and until August the price remained at \$1.35 a barrel for the market standard. Then the price began to soar, and on December 17 petroleum was selling at \$2.15. Indications now are, says the statement, that the price will soon reach \$2.50, its previous high record.

One production fact brought out by the survey is that crude petroleum stocks held in reserve, the largest ever known, increased 50,000,000 barrels in 1915, and at present more than 220,000,000 barrels are being held. Field storage by producers accounts for 24,000,000 barrels of this.

Export figures for the first 10 months of 1915 show that gasoline exports dropped far below the same period in 1914, and slightly below 1913. During the 10 months ended with October last, 98,471,466 barrels left the United States, against 140,275,273 barrels for the same period of 1914 and 100,353,871 barrels for 1913.

The relation between the cost of crude petroleum and gasoline is hard to determine according to officials who have given the subject study because of the varying grades of petroleum and the variety of oils produced in refinement. An increased demand for gasoline, they say, means an increased production of kerosene, lubricating oils and other petroleum products. All petroleum products have risen in price.

Officials familiar with the situation say the recent discovery of Dr. Walter F. Rittman, a government chemist, of a process

for obtaining from crude oils 200 per cent more gasoline than by old methods, probably would have a bearing on both production and price before another year had passed. Several companies already have started production under the new method. Their output, and the output of others to be started, it was said, would be felt soon on the market.

### FIGHT GASOLINE DOPERS

Los Angeles, Cal., Jan. 3—Motorists of Los Angeles have been relieved of the fuel doper by a system of municipal gasoline inspection. The city department of oil inspection has conducted a vigorous campaign against unscrupulous garage operators and supply stations. The work of the department has been extended outside the realm of the passenger car. Distillate and oil has also undergone the inspection of the city's experts.

Los Angeles is the first American city to enforce a system of fuel inspection. In and around the city there are more than 46,000 motor cars in operation. These cars use 101,200 gallons of gasoline per day, at an average of 13 miles to the gallon.

Certain garagemen, realizing that they could make an extra ½ cent per gallon, mixed cheap distillate with the gasoline, selling the combination at regular gasoline prices. Many carburetor ills in Los Angeles were due to the cheap fuel.

The oil companies suggested that the city take the matter in hand. As a result an ordinance was adopted early in 1915 providing a standard for the fuel and making it unlawful to sell any fuel in Los Angeles unless said fuel came up to the specifications of the city, the violation of this ordinance making the garageman liable to a revocation of his license.

In Los Angeles, 65 per cent of the gasoline is sold to motorists at corner supply stations. There are now 300 of these in the city. The rest of the gasoline is sold from the city's 350 garages and a number of portable tanks operated by stores. The city's system of inspection is extended to the oil wagons, tanks and refineries and to cover 1,600 grocery stores and something like 1,100 drug stores.

In the first 2 months that the department was in operation, four deliberate cases of gasoline adulteration were discovered. This adulteration consisted of a half and half mixture. To date, almost 100 dealers have been notified that they were selling fuel that did not come up to the standard set by the department and warned to sell only gasoline that met the requirements of the law. Two refineries were instructed to improve the grade of gasoline put on the market.

## To Take Over Grant Corporation Plans \$4,000,000 Organization to Handle Ohio Concern

### Will Underwrite Big Stock Issue for the General Market

DETROIT, Mich., Jan. 3—Andrews & Co., of this city and Chicago and Livingstone & Co., are interested in a new corporation now being formed with a capital stock of \$4,000,000 to take over the business of the Grant Motor Co., Findlay, O.

These brokers will take \$1,000,000 in preferred stock and \$2,000,000 in common stock. The balance of \$1,000,000 of common stock is to be held to exchange for preferred stock.

A syndicate is now being formed by the purchasers for the purpose of underwriting \$1,000,000 preferred and \$600,000 common stock and placing it on the market. The preferred stock, which will pay 7 per cent dividends, is to be convertible into common at the option of the stockholder, prior to January 1, 1919. After that time, it will be redeemable at 120 plus the accrued dividends.

The present capital stock of the Grant Motor Co., which was organized in 1913, is \$200,000. This is double the original capitalization.

### PLAN TO REFINANCE COMPANY

Philadelphia, Pa., Jan. 4—Stockholders and creditors of the Standard Roller Bearing Co., of Philadelphia, have been presented with a plan for refinancing the company. The company proposes to assess stockholders for \$730,713 and to reduce the debt and capital from \$5,799,835 to \$3,891,758, with provisions further that the holders of notes and other accounts payable are to be offered the alternative of 60 per cent of their claims in cash as payment in full, or 80 per cent of their claims in the shape of 20-year redeemable income certificates. Stockholders of first and second preferred and holders of common stock will be assessed various amounts and will be given a percentage of their holdings in new stock.

### OVERLAND ADOPTS NEW SALES PLAN

Toledo, O., Jan. 4—Beginning January 1, a new sales work plan went into effect at the Willys-Overland Co. Instead of handling all the sales work from the general offices here only, the country has been divided into thirteen sales zones, with a zone manager directing each zone.

Besides these zones, the Willys-Overland Co., has already and will continue to open direct factory branches. For this reason there has been created the position of director of branches, and former Advertis-

ing Manager G. M. Berry has been promoted to this position.

The cities where branches are or will be established are Atlanta, Cleveland, and Kansas City. Service buildings will be located or are already in operation in Boston, St. Paul and New York. These buildings also will be the zone headquarters.

Zone cities and their respective managers are as follows: Boston, W. B. Sawyer; New York, E. M. Lied; Philadelphia, A. W. Barber; Atlanta, E. N. Culver; Toledo, K. R. Jacoby; Kansas City, E. G. Hosler; St. Louis, J. E. Toole; Chicago, C. E. Wagner; Minneapolis-St. Paul, F. N. Coats; Omaha, C. H. Tyler; Dallas, W. D. Sapp; Denver, George A. Clark; Pacific coast, B. J. MacMullen.

All zone headquarters will have stocks of cars and parts for the quick delivery and distribution to Overland dealers and owners.

### FEDERAL BRINGS OUT NEW TRUCK

Detroit, Mich., Jan. 3—The Federal Motor Truck Co. has brought out a new 2-ton model. This was made necessary owing to the increasing demand from Federal distributors for a truck having a greater carrying capacity than 1½ tons and yet less than the 3½-ton truck which the company is making. The price of the new truck is \$2,100. It will be optional with the purchaser to have his truck with either a wheelbase of 144 or 168 inches. The motor is a Continental, 4½ by 5¼, and the ignition is single, the Eisenman being used. The gearset is of the selective sliding-gear type. The axle is of the floating type. Springs are semi-elliptic.

### OVERLAND CUTS FOUR PRICE

Toledo, Ohio, Jan. 4—The Willys-Overland Co. has reduced the price of its larger four-cylinder Overland car \$55, or from \$750 to \$695. It is stated that this reduction is made possible by the purchase of materials before war sent prices soaring. As an example of the saving effected as compared with present prices of these materials, the company has been able to save \$3,500,000 on aluminum alone, while the savings on steel and other raw materials are in proportion. Quantity production is another factor in the reduced price of this model 83-B, large factory additions recently completed having enabled the company to more than treble its output.

### NEW FIFTH WHEEL COMPANY

Springfield, Mass., Jan. 4—The Martin Rocking Fifth Wheel Co. has taken over the business and the patent rights of C. H. Martin, Springfield, Mass. The officers of the new corporation are: C. H. Martin, president, Adolph A. Geisel, treasurer, and H. G. Farr, secretary. The tractor-semi-trailer business had grown to the point where it was necessary to take in additional capital in order to supply the fifth wheel connections as fast as they were ordered.

## Balk Chevrolet Merger General Motors Directors Look Unfavorably on Stock Exchange Plan

### Majority of Directorate Notify Stockholders of Their Attitude

NEW YORK, Jan. 4—A conference of directors of the General Motors Co., held in this city recently, developed the fact that a majority of the directors of the company are opposed to the plan for a merger with the Chevrolet Motor Co., advanced by W. C. Durant, who proposed turning a controlling interest in the larger company over to the Chevrolet by means of an exchange of stock. The capital of the latter company, as a result of the plan, was increased from \$20,000,000 to \$80,000,000.

A letter has been sent to the General Motor stockholders by eight of the fourteen directors of the company stating that they are not a party to any arrangement looking to the vesting of control of the General Motors Co. in any other company, and that they favor the formation of a 3-years' voting trust beginning November, 1916, at which date the term of the present board of directors expires.

These directors ask the stockholders to signify whether they wish to unite in forming such a voting trust, and state that if a sufficient number of the stockholders so desire, action to that end will be taken. The voting trust proposed, which they say is favored by a majority of the board, is to be made up of five members of the present board as trustees, to be selected by the present directors. The statement sent to the stockholders was signed by S. F. Pryor, A. H. Wiggin, Thomas Neal, C. H. Sabin, J. J. Storrow, C. S. Mott, Albert Strauss, and E. W. Clark.

### H. A. LOZIER COMPANY FORMED

Cleveland, O., Jan. 4—The H. A. Lozier Co. has been formally organized by the election of the following officers: H. A. Lozier, president; E. W. Foote, vice-president; E. G. Tillotson, treasurer, and Frank H. Ginn, secretary. Mr. Tillotson is the head of the bond house of the Tillotson & Wolcott Co. and Frank H. Ginn is a prominent attorney. It is understood that the stock has all been taken by a few persons.

### BIG DIVIDEND FOR PAIGE

Detroit, Mich., Jan. 3—While officials of the Paige-Detroit Motor Car Co. say they do not know anything about it, local brokers said today that at the annual meeting to be held next week, the Paige company will declare a stock dividend of probably not less than 100 per cent, in addition to its monthly cash dividend of 5 per cent.

# "A Little Old Last Year's Car" That's Almost Forgotten

Venerable Forebear of the 1916 Model, Built Before Civil War, Housed in Barn of Long Island Village

THIS is the week that all New York pays tribute to the 1916 motor car, vehicle of perfection and luxury, symbol of speed, stamina and refinement. At the Grand Central Palace, thousands are discussing the merits of the twelve, the eight, the six and the four, inspecting engines made of aluminum and gazing upon bodies of graceful curves and gorgeous fittings.

With their interest centered in the creations of today, the connoisseurs have no time or inclination to go back 60 years over the trail of yesterday where they will find the forebear of the modern motor car, forgotten and unhonored in a city that it talking of motor cars by day and dreaming of motor cars by night.

"The little old last year's car," as The Flapper in Harry Leon Wilson's novel and play "Bunker Bean," would term this antique, is gathering dust in a barn only 45 minutes from Broadway, for hidden away in the sleepy little village of

Locust Valley, on the north shore of Long Island, is probably the first horseless carriage ever built in this country.

The quest of this mechanical patriarch is not difficult. All the villagers know of it and are eager to tell all that they know. The steam wagon, as it is called in Locust Valley, is now in the possession of the grandchildren of the inventor, Mrs. Ernest Kohler and Henry Dudgeon.

The garage of the forebear of the American motor car is not called by that French name. It is housed in a barn. There it stands in a corner, in dignified aloofness from a small Ford and a 1915 Pierce-Arrow. In appearance, it looks like the combination of a locomotive and hay wagon. As it runs by steam, an immense boiler extends down the middle of the car and a smoke stack stands up in front. The driver's seat and steering wheel are at the back and the seats for passengers are

By Dorothy B. Nichols

along both sides. The wheels are solid, built of wood and having steel tires.

The story of the historic steam wagon reads something like romance. Back in the late fall of 1855, three men, all well known in mechanical circles, made a wager

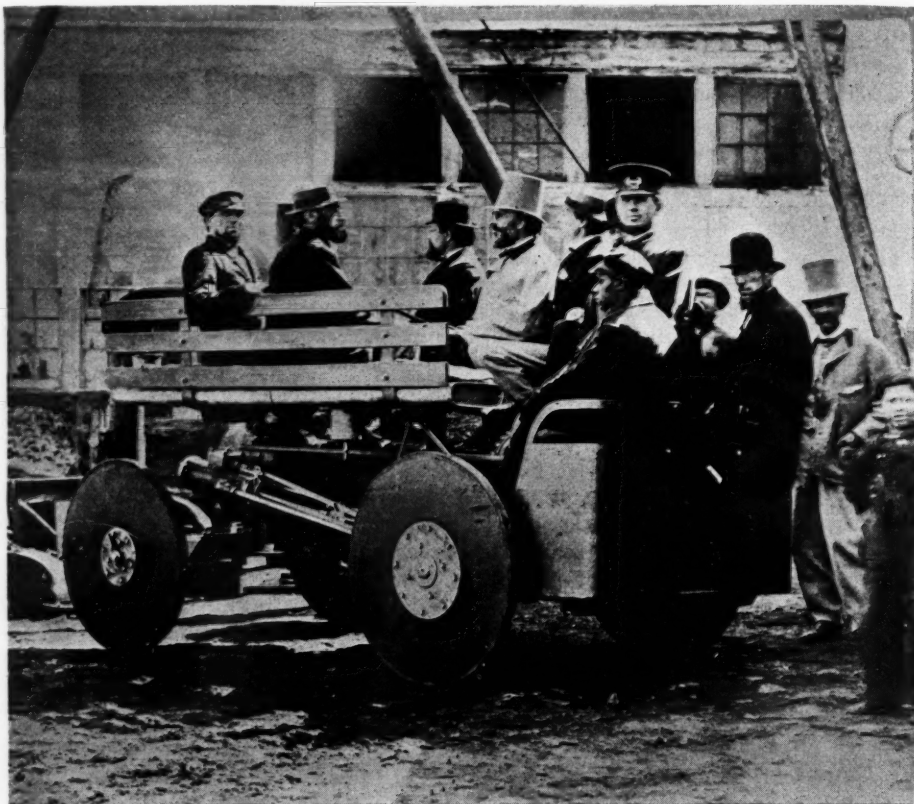
one now at Locust Valley. The machine was built in Mr. Dudgeon's shop on Columbia street, New York, where every bolt and screw was made.

The steam wagon was the talk of the day. When it was finished, a picture of it was taken outside the shop and in it were Fernando A. Wood, then mayor of New York; the chief of police, Fletcher and Hudson, some of the mechanics and Mr. Dudgeon himself, who is shown in the accompanying illustration seated at the steering wheel.

Dudgeon then was living at Hackensack and used to drive back and forth from his home to his shop in the steam wagon. The principal drawback to the machine seems to have been the frightful noise which it made. Its appearance was invariably heralded by a stream of runaway horses. After a few such experiences, enjoyed, it is feared, by Dudgeon's somewhat satanic sense of humor, he was forbidden to run the

car in New York. Shortly after this he moved out to Locust Valley and he and his son used to run their car about the quiet country roads there. Great was the consternation it aroused among the country folk. One old man, seeing and hearing its rapid approach, rushed in to his wife, yelling: "Maria, Maria, come quick; the railroad is off the track and is running down the hill."

When Dudgeon wished to go out for a little afternoon spin, he always sent a colored boy ahead on horseback to warn the people what was coming. But even with this precaution, he always was busied with damage suits brought by the irate owners of runaway horses. Trips in this car must have been something on the order of a parade, as it was found necessary to start a wagon some hours ahead of the horseman with the required supply of coal and water.



Start of the first horseless carriage trip ever made in New York. The date was 1855 and among the notables that made the epochal tour were the mayor, chief of police and inventor of the steam wagon, Richard Dudgeon

as to which could invent a steam wagon which would go. The first locomotive had already made its appearance, but as yet there was nothing which could run off rails. The three men were William Fletcher, famous builder of steam boat engines, "Boss" Hudson of the Roger's Locomotive Works, and Richard Dudgeon, inventor of the Dudgeon hydraulic jack and the rolling tube expander. The three set about their task with the enthusiasm of school boys and in less than a year the work was completed. Dudgeon's was the only wagon which succeeded and it went at the rate of 40 miles an hour; that is, it could go at that speed if the driver was not over-particular about living. Its usual speed was 30 miles an hour. This machine was burned while being exhibited at the Crystal Palace in New York. Dudgeon built another on the same model, which was completed in 1860. This is the

Interesting as I found the anecdotes concerning the machine, I found the life of its inventor more so. He was born in Scotland in the early part of the last century and came to this country a poor boy of eighteen to seek his fortune. He served his apprenticeship in what was then one of the most important machine shops in New York but which is now no longer in existence. It was while he was still an apprentice that he invented the Dudgeon hydraulic jack. He was too poor, however, to put it on the market himself and had to go from door to door, carrying his jack and trying to interest someone in it. At last a wealthy man, James A. Detmas, saw it and, believing in it, advanced the money. The invention was an immediate success. Dudgeon, in partnership with Detmas and a man named Lyons, started the machine shop on Columbia street which is still in existence and in which the steam wagon was built.

#### Inventor Far From Sociable

Dudgeon had very little to do with the business end of the enterprise. He was an inventor, not a business man, and fairly lived in his shop. When he moved out to Locust Valley, he had a little shop built on his place and all the time he could spare from his New York shop he spent there. He would sometimes get an idea for an invention in the middle of the night and would get up and work on it through the next day until he had gotten his idea in tangible form. In fact, he doesn't seem to have had very peaceful slumbers, for the country people tell tales of his getting up in the middle of the night to read his Bible, and, not satisfied with his own godliness, of his arousing his family to share the scriptures with him. They even hint that there were other and less praiseworthy reasons for his wakefulness and that the cup that cheered Bobbie Burns did not fail to cheer his countryman also. But too much faith must not be placed in these stories, for country people love to gossip and this eccentric, sharp tongued, kindhearted old genius, gave them much about which to talk.

He seldom talked himself and never while he was working. One old gentleman, a boy in Dudgeon's day, who used to play with the inventor's son, told me: "I'd go around to the house past the machine shop, and if the old gentleman looked up and said 'Good morning, brother,' I'd stay, but if he didn't, I'd run." Some of the neighbors were less wise than the boy and paid accordingly. One genial old man, longing for a little friendly conversation, came around to the little shop at Mr. Dudgeon's country place and after asking a number of foolish questions, looked at a little wheel at which the inventor was working and asked, "How does that go?" "It goes around," snapped the irritated old gentleman, without looking up. In spite of his sharpness, he was the idol of all the small boys in the neighborhood, and to obtain a ride

on the steam wagon with him was to them the seventh heaven of bliss, however it may have appealed to their parents.

As a matter of fact, his chosen conversations seem to have been with children and the mechanics in his shop. He carried his dislike of useless conversation to such an extent that his partner complained that he turned trade away from the house by his unfriendly attitude to visitors. "Go away," he would shrill with a Scotch brr that would make Harry Lauder envious. "I pay a man to talk to devils like you," and he would continue his interrupted work.

He was always a workingman's man, disliking show and pretense of any kind. A story is told of him that he was once met at the station by his carriage and that he walked 6 miles to his home rather than ride because his wife had the coachman dress in livery.

Dudgeon was far ahead of his time and many of the ideas which he found impossible to work out have since been perfected. He was much interested in the invention of an airship, but owing to the fact that gasoline power had not yet been discovered and that steam engines were too heavy to be carried, he was unsuccessful in his attempts to build one. He did make a steam engine which was much lighter than any that had then been used, but even that was too heavy. This was practically his last work. When his airship failed, he seemed to lose interest in everything. Perhaps the brain which had worked so tirelessly all those years was weary. At any rate he grew more silent and taciturn and would never go near his shop again. In 1890 he died, a lonely, disappointed old man, leaving as a heritage of his genius the "little old last year's car" to which none pay homage now.

## St. Louis Now Conducts Free Tests of Headlights



Interior of St. Louis shadow box

IN the city hall at St. Louis, Mo., is a shadow box where the headlights of more than 5,000 motor cars have been tested and adjusted in conformity with the recently adopted anti-glare ordinance without expense to the car owner. To the steering wheel of every machine tested is affixed a lead seal which makes the owner or driver immune from arrest for violation of the law which requires that the main shaft of light shall not be higher than 3 feet from the ground at a distance of 75 feet in front of the car. The shadow box proper is made of wood and is 6 feet high and 4 feet wide, painted white. It is framed in black curtains which extend about a foot from the board. A black canvas curtain, which drops behind the distant archway, makes the tunnel as dark as a Stygian cave. The headlights are thrown on the shadow box which has a graduated scale; a city inspector tilts the lamps until the main ray of light falls on the 3-foot line of the device; and then affixes the O. K. seal to the car.



Entrance to shadow box for testing headlights at St. Louis city hall

## Uncle Sam Reports More Regard for Public Safety

IS the deadliness of the motor car increasing or decreasing? This question seems to be answered in a very conclusive manner by the United States census bureau, in making public some preliminary mortality statistics for the year 1914, which indicate that during the 5 years from 1909 to 1914 the number of cars in use in the United States increased more than twice as rapidly as the number of fatalities caused by them.

At the close of 1909, according to figures compiled by the National Automobile Chamber of Commerce, from state registration reports, due allowance being made for duplicate registrations, the number of cars in use in the United States was approximately 200,000; by the close of 1913 it had risen to 1,270,000; and a year later, at the end of 1914, it was 1,750,000.

In the meantime the number of deaths due to motor car accidents and injuries increased from 632 in the death-registration area in 1909, containing 56 per cent of the population of the United States, to 2,623 in the same area in 1914; and the increase from 1913 to 1914, for the registration area as constituted in 1913, then containing 65 per cent of the population of the country, was from 2,488 to 2,795.

Thus a 5-year increase of 775 per cent—accepting as reliable the figure compiled by the National Automobile Chamber of Commerce—in number of machines has been accompanied by an increase of 315 per cent in motor car fatalities; and a 1-year increase of 38 per cent in num-

ber of machines has been accompanied by an increase of 12 per cent in fatalities.

Perhaps a more reliable comparison, from the statistician's point of view, can be made between the increase in number of cars in use and the increase in the rate per 100,000 population for deaths caused by them. This is because, with a given number of machines in use in a given area, the fatalities due to them will tend to be proportional to the population of that area. When the comparison is made on this basis, it appears that a 5-year increase of 775 per cent in number of machines has been accompanied by an increase of 258 per cent—from 1.2 to 4.3 per 100,000 population—in the death rate resulting from motor car fatalities. Similarly, a 1-year increase of 38 per cent in number of cars has taken place along with an increase of only 10 per cent—from 3.9 to 4.3 per 100,000—in the death rate charged to them.

One cause of this proportional decrease in the destructiveness of the motor car is undoubtedly to be found in a reduction in average annual mileage per machine; but, after due weight is given this factor, and a suitable margin is allowed for possible error resulting from inaccuracy in the estimated portion of the motor car statistics, the figures still appear to furnish ample justification for the conclusion that the motorist today is exercising more care and more regard for public safety than he did a few years ago. The seeds of safety first, sown in the past 2 years, are bearing rich fruit.

## The Engineer's Nerve Strain

"YOU don't realize what a nervous strain you are putting on a man in the cab," said a Southern Pacific locomotive engineer the other day to a motor car driver, "when you dash up toward a crossing just ahead of his train. There he is in his cab and he knows that he can't stop his engine. There you are in your car speeding toward the crossing just ahead. You probably know that you are going to stop just at the edge of the track and look up and laugh at him. He doesn't. He doesn't know that you even see the train. He doesn't know but what you are going to try to dash across ahead of him. It's a joke maybe to you. To him it's a few seconds of the most intense agony. Why do you do it? When you see a train coming and know that you can't make the crossing and don't even intend to try to make it—why don't you slow down and give the engineer the assurance that his train is not about to hurl you into eternity?"

"I never thought of it in that light," said the motorist. "I guess we do those things in a spirit of deviltry. I can tell you one thing, though. I'm never going to harrow up another engineer's nerves."

## Joins in Safety First Campaign

AT the December meeting of the National Automobile Chamber of Commerce, a safety first committee was appointed by Charles Clifton, president, who named J. Walter Drake, of Detroit, as chairman.

The committee will aid the movement to safeguard workers in motor car factories by the application of protective devices to dangerous machinery and co-operate with safety first organizations seeking to reduce the number of highway accidents.

Education of the public in the ways to avoid accidents through talks in public schools and by special articles will be offered, as reports of the New York police department show that 90 per cent of street accidents are due to carelessness of pedestrians and children playing in the streets.

While car drivers, as a class, are the most careful users of the streets, there are a few reckless owners and chauffeurs who discredit the rest. The manufacturers will lend moral support to severe prosecution of such offenders and against speeding, cutouts and useless horn blowing, which frighten people.

### A GOOD RESOLUTION FOR THE NEW YEAR

**D**URING 1916, I will show the same courtesy to the motorist and pedestrian that I meet on the road as I would the guest in my home; I will drive carefully and observe the traffic rules; I will be my brother's keeper as well as my own; thus working in the interests of Safety First, which is only a modern exemplification of the world-old Golden Rule.



# The Motor Car Repair Shop



## Five Simple Polarity Indicators

THE increasing use of the storage battery in gasoline automobiles for supplying lighting, starting and ignition current makes it desirable for the motorist and repairman to increase their store of practical electrical knowledge. While most batteries are used in connection with engine driven generators that keep them in a fair state of charge, the demands upon them may be so severe as to make charging from some outside source necessary. The important point is to use only direct current for charging the battery and to be sure the positive wire of the charging line is joined to the positive terminal of the storage battery. While special polarity indicators working on the electro-magnetic principle are available, there are simple means within the reach of all motorists to indicate which of the two wires of the charging line is negative and which is of opposite polarity.

### Using Pole-Finding Paper

Pole-finding paper is the easiest handled of all indicators. These may be procured ready for use and are sometimes sold in small books or perforated sheets. The color indicating polarity differs with the various papers, the negative may be indicated as blue, red or brown, the positive as black or red. The paper treated is either red, white or blue blotting paper. The simplest method of making this paper is to soak white blotting paper in a solution composed of one-half pint water into which a teaspoonful of sodium sulphate is dissolved and also of starch and iodide of potassium. The starch is put in hot water to insure that it will be thoroughly dissolved, then the chemicals are added. The soaked paper is dried in the air. When used, the paper is moistened with water and the ends of the wires are touched to the paper, only a short distance from each other. This paper will show the positive pole as a dark spot, see Fig. A. Ordinary blue print paper will show polarity if moistened in the same way. The dark blue color will change to a yellowish white at the negative or—pole.

The humble potato may be made to serve as a polarity indicator as shown in Fig. B. Clean a portion of the skin and by holding the ends of the wires on same, the positive wire will show a green color surrounding it. The negative will not show any indication. The potato may also be used to indicate direct or alternating current. If A. C. current is passed through it, each wire will show a green impression. For low voltages, such as produced by a battery, the wires should be placed closely together but not touching. For 110 volts, the wires can be  $\frac{1}{2}$  inch or  $\frac{3}{4}$  inch apart.

A simple device that can be easily made up is outlined in Fig. C. This consists of a glass tube  $\frac{5}{8}$  inch or  $\frac{3}{4}$  inch outside diameter with binding posts passing through rubber stoppers at each end having electrodes projecting into the liquid with which the tube is filled. The line wires are connected to the terminals and the liquid will become discolored at one or more of the terminals, depending upon the chemical employed. The instrument will indicate polarity of currents of low voltage, two volts is said to produce discoloration despite the high internal resistance. By shaking the instrument when it is removed from the circuit, the liquid will assume its original color. If phenolphthalein solution is used the positive pole will be indicated red. Diluted sulphuric acid with a few drops of methyl orange will also indicate red at positive. A solution of sodic sulphate colored with syrup of violets, the exact proportions being immaterial, will indicate the positive pole red and the negative terminal green. A solution of diluted caustic soda with a few drops of phenolphthalein are mixed and just enough diluted sulphuric acid is added, drop by drop, to neutralize the blue color. The negative pole immersed in this liquid will turn the surrounding solution blue.

A very simple way, but one that calls for careful observation, is to immerse the two wires in some electrolyte contained in a beaker as shown in Fig. D. This may be

water acidified with vinegar or sulphuric acid or made a conductor with some alkali such as common salt, washing soda or sal-amoniac. The negative wire will have many more bubbles around it than the positive.

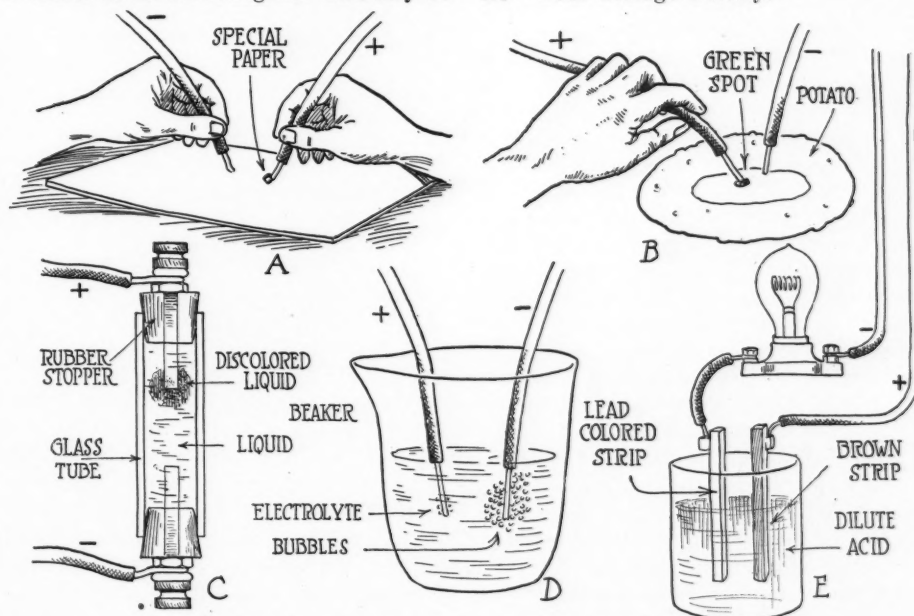
Another way is to make a miniature storage battery as shown in Fig. E. Two clean strips of lead are placed in dilute sulphuric acid and spaced about  $\frac{3}{8}$  inch or  $\frac{1}{2}$  inch apart. If a 110 D. C. circuit is to be tested, a lamp of that voltage is put in series with the plates as shown, and after the current has been flowing for a time, the plate to which the positive wire has been connected will turn brown. The negative strip will remain grayish or lead color.

### Using the Hydrometer

Nine out of ten storage battery faults are the result of insufficient cars. The Willard Storage Battery Co., Cleveland, O., in its effort to remedy this condition, does more than to offer suggestions to the car owner.

Most people already know the value of a hydrometer syringe for testing the specific gravity of their batteries. The Willard company sells a strong, well made hydrometer at the nominal cost of one dollar. This is carefully packed in a heavy cardboard tube for mailing, together with instructions for assembling and operating.

In addition to this, the Willard company will furnish anyone who requests it a booklet "Your Storage Battery."



SEVERAL INDICATED METHODS OF DETERMINING POLARITY

A shows the use of pole-finding paper, which denotes polarity by color; B illustrates the use of a potato to determine polarity; C is a glass tube filled with liquid, which is discolored by the action of the current; D is a beaker filled with acidified water, the negative pole having the most bubbles around it; E is a miniature storage battery, one of the plates of which becomes discolored when in contact with positive pole

# The Readers' Clearing House

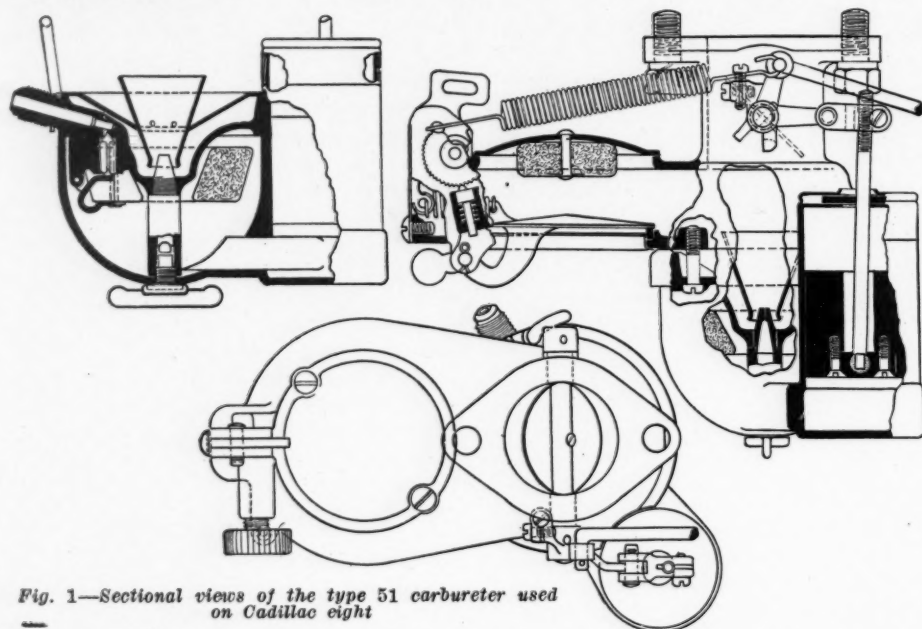


Fig. 1—Sectional views of the type 51 carburetor used on Cadillac eight

## THINKS QUESTIONS ARE FOOLISH Believes Many of So-Called Motor Ills Are Due to Carelessness

CHICAGO—Editor Motor Age—In my opinion many of the questions asked in this department are decidedly foolish, for I feel that any man who knows so little regarding ignition and carburetion, judging from the questions asked, should not be permitted to run a motor car.

Today, 30 per cent of the car owners do not know how to make ignition or carburetor adjustments, that is, so that the regulation of gasoline to air is uniform at all speeds with good pulling power combined, for the carburetor adjustment and the manipulation of the spark lever to meet these speeds or carburetor adjustment. This is why there are so many foolish questions asked in the different publications from time to time.

If a man owns and drives a car, a man who should know what the car is doing and what it will do at any time, and one who ought to know it like a book, why doesn't he make his own adjustments and scrupulously keep every part of the mechanism in order, such as washing, cleaning, filling grease cups weekly and turning down same every day, the same as a salaried garage and repair man? This is where inefficiency is decidedly prominent.

The majority of motorists do not care, forget, or they do not know how—more generally the latter.

The same condition exists with regard to the attention given or should be given a storage battery. The majority of motorists do not know how, or do not understand the care and attention this essential unit should have, and the many questions appearing in this department bear me out in

this. Am I right in making such a statement?

The other day a man with a 1914 Case car had some storage battery trouble and he seemed unable to remedy an intermittent and sometimes a constant misfire in the motor. I inquired about the storage battery, asked if he filled the cells with acid instead of water. He replied he had put in acid by mistake but forgot about it later until he discovered the condition of the motor. This was just a case of carelessness which could have been avoided if the car owner had been familiar with the subject of ignition, and which every man who owns a car should know.

The same occurs in the purchase of a car. Most buyers do not know what constitutes the mechanism of a motor car, and some care less.—J. C.

## DETERMINING RADIATOR SIZE Reader Wants Information as to How Much Cooling Space Is Necessary

Philadelphia, Pa.—Editor Motor Age—How do you calculate the proper size radiator of the tubular type for a 3 by 4, four-cylinder motor?—W. W. Meirs.

The number of cubic inches radiator capacity required per horsepower largely depends on the construction of the radiator, the same radiator capacity not being used in cellular types that has been adopted in tubular. In fact tubular radiators have not all the same water capacity because of the different cooling coefficients of them, due to the more or less effective radiating fins or flanges carried on the tubes. A definite idea of the cooling capacity of the tubular type may be obtained from the course pursued by the Long Mfg. Co., Detroit, maker of a spiral fin tubular type radiator. For a four-

cylinder motor with 5-inch bore and 5-inch stroke, the method used in determining its radiator capacity needed is as follows: Multiply the cylinder diameter by the piston stroke by the number of cylinders, in this case it is 100, and the company uses 100 linear feet of its  $\frac{3}{4}$ -inch tubing for such a motor. Should the tubing be  $\frac{5}{8}$ -inch, then 200 feet is needed. One foot of the  $\frac{3}{4}$ -inch tubing has 210 square inches of cooling area on the spiral fins, and 1 foot of the  $\frac{5}{8}$ -inch tubing has 124 square inches cooling area. This gives practically 20,000 square inches cooling area for a 5 by 5 four-cylinder motor, which, according to the N. A. C. C. rating would be 40-horsepower. This carried still further would give practically 500 square inches of radiating area per horsepower. From another point of view the 100 feet  $\frac{3}{4}$ -inch tubing would contain 520.4 cubic inches of water, which works out practically 13 cubic inches per horsepower. If the radiator is of the cellular construction different figures apply.

## ANSWERS TO SPEED QUESTIONS Dimensions of the Twelve-Cylinder Sunbeam—Stock Car Speeds

Saranac Lake, N. Y.—Editor Motor Age—Kindly publish a sectional view of the carburetor used on the type 51 Cadillac Eight.

2—Is the Cadillac Eight the fastest American stock eight?

3—What is the fuel consumption per gallon of Resta's Peugeot and Anderson's Stutz?

4—What is the speed of the seven-passenger 1912 Packard?

5—What is the bore, stroke and gear ratio of De Palma's twelve-cylinder Sunbeam, and how many valves does it use?

6—Which four-cylinder Cadillac was the fastest, the 1913 or 1914 model?—Subscriber.

1—Sectional view of the type 51 carburetor of the Cadillac eight is shown in Fig. 1. It should be noted that this is not the same as the carburetor on the type 53 Cadillac, there being some improvements in the latter that are not found on the type 51 instrument.

2—There is a new car just announced that has shown slightly higher speed in official trials.

3—Motor Age does not know.

4—Probably about 60 miles per hour.

5—The twelve-cylinder Sunbeam is 90 by 150 millimeters, which is 3.54 by 5.91 inches, bore and stroke respectively. The motor has twenty-four valves, or one inlet and one exhaust per cylinder. We do not know the gear ratio.

6—The 1914 should show more speed, if there is any difference between them.

## Taking Up Wear in Bearings

Stromsburg, Neb.—Editor Motor Age—Would like detailed instructions for scraping and taking up the wear on the crankshaft and connecting rod bearings. Understand this is a difficult job, but would like detailed information on the method of doing the work. My car is an old style Maxwell with barrel-type of crankcase.—A Reader.

Unless you have to put in new bearings, it is unnecessary to scrape them. A bear-

ing that has been run for some time has a smooth surface and does not need this treatment. However, new bearings must be scraped with a tool known as a scraper, and which any motor car supply store should be able to furnish you. The process is one of smoothing the surface as much as possible. It is a matter of common sense and skill, and you are not advised to try it unless there is no repair man close at hand who knows how to do it.

However, to take up the wear in the bearings you have, and this is all that should be necessary if they have not been burned out or damaged in some way, it is necessary only to take out shims and then tighten up the caps again to remove any lost motion. This applies to the connecting-rod bearings as well as the main bearings. Try taking out one shim from each side of the cap first. Then see if this is not enough to permit of tightening up the cap so as to remove the play. If one shim from each side will not do it, try taking two, etc. You must be careful not to tighten the bearings so that they bind. Do not try to turn the heads off the bolts in doing it, but set them up with reasonable snugness.

In the Maxwell engine you refer to, it will be necessary to take the motor out of the car to get at the main bearings with any degree of satisfaction.

#### PUTTING PEP IN AN E. M. F. It Is Inadvisable to Lower the Compression —Best Let it Alone

Amarillo, Tex.—Editor Motor Age—I am building a racing car out of an E-M-F and desire the following information:

1—Does Motor Age recommend raising or lowering of compression? If so, state pounds per square inch.

2—Would it be advisable to lighten the fly-wheel?

3—Would there be any advantage in porting cylinders at bottom of the piston stroke on opposite side of valves? If so, state size of holes.

4—Am trying to get all the speed possible out of the car, using Bosch double ignition magneto, either a Master or Rayfield carburetor, special light pistons, and a special camshaft. Can Motor Age offer any suggestions which will tend to get more speed?—C. A. Graham.

1—Whatever you do, do not lower it. We would advise letting it alone.

3—No.

4—If you make the changes you mention, you have done about all you can to increase the speed. Of course, you could reduce the back pressure somewhat by eliminating a muffler and exhausting through short pipes running outside the hood from each cylinder, but you may not want to do this due to the unpleasant noise. Look to the oiling system and the cooling. Put them in the best shape you can, and you might also rig up a direct pressure pump for forcing the oil to the main bearings. You could also add to the speed by using oversize tires or larger diameter wheels, although the pulling qualities would be impaired thereby. Take off the fenders, as they offer wind resistance.

#### Redesigns Ford Car

Sherman, Tex.—Editor Motor Age—I have recently redesigned a Ford to give

it more speed. The motor was bored out, fitted with lighter pistons and rods, larger valves and a special camshaft. It was equipped with a Bosch magneto, a Rayfield carburetor and Houk wire wheels. The rear axle is geared  $2\frac{3}{4}$  to 1.

The front spring was underslung and the rear axle dropped to 6 inches. Its appearance after the redesigning is shown in Fig. 2.—George T. Bishop.

#### NOT ADVISED TO DRILL RODS Would Lighten Chalmers Reciprocating Parts to Give Speed

Decatur, Ill.—I have a Chalmers 30 which has been rebuilt into a speedster. I want to drill the connecting rods in order to lighten them. How can this be done without weakening the rods?

2—Would it be advisable to fit light-weight pistons to an old cylinder if it is not scored?

3—What speed should I get out of this motor?—Charles T. Hamilton.

1—You could not drill the connecting-rods of this engine without impairing their strength. Such drilling is done only where the design has been worked out with that specially in view. It is for lightness of reciprocating weight that it is done, especially where high engine speeds are to be obtained. Your Chalmers 30 engine would never attain high enough speed to make any appreciable difference through thus drilling the rods, even if it were practical to do so.

2—You could use light-weight pistons to advantage in your motor, providing they are all of the same weight.

3—About 1,500 r. p. m. is the best engine speed. It might run up to 1,800 r. p. m. in some instances. But if you refer to car speed, you might get 50 to 55 miles an hour.

#### SIZE OF BUICK 24 INTAKE MANIFOLD Reader Also Asks Method to Take Up Rear Axle End Play

Flora, Ind.—Editor Motor Age—What is the size of the inlet manifold in the model C-24 1915 Buick?

2—Is there any way of taking up end play in the rear axle? If so, kindly explain.

3—How much oil can be used from the level of the petcock in the crankcase before the pump stops circulating oil?—G. B. Cook.

1—The inlet manifold is standard size for a 1-inch carburetor; in other words,  $1\frac{1}{8}$ -inches in diameter.

2—We do not understand what you mean by "end play in the rear axle," as the

Buick company states that no adjustments are provided in the differential and main shafts of this axle, as it was fitted with non-adjustable roller bearings. If end play has developed at these points, it can be taken care of by shimming up with thin washers behind the differential thrust bearings, or behind the differential intermediate gears, depending upon the point at which the play has developed. End play in the propeller shaft can be taken care of by adjusting the propeller shaft bearing at each end of the torque tube. To adjust, remove the cover plate on the pinion flange and snap ring from nut at the forward end of the propeller shaft. To move the pinion toward the ring gear, loosen the nut at the forward end and tighten nut at the pinion flange.

3—The Buick oil pump will circulate oil as long as enough remains in the crankcase to cover the pump gears; in other words, until the oil reservoir is practically drained dry, but the level in the reservoir should be kept at the height of the petcock in order to secure a sufficient circulation of cool oil to insure proper lubrication of the motor.

#### PAINTING FENDERS AND HOOD Process for Doing a Good Job Is Tedious But Repays in Results

Mt. Carmel, Ill.—Editor Motor Age—Who makes the Stewart gasoline vacuum feed for carburetors?

2—Explain the correct method of refinishing fenders and hood on a high-grade car. Name the best body varnish.

3—Do aluminum alloy pistons have the wearing qualities of iron?

4—What three cities rank next to Detroit as motor car manufacturing centers?—X. Y. Z.

1—Stewart-Warner Speedometer Corp., Chicago, Ill.

2—If the hood and fenders are smooth, and are simply dull from weather, no preliminary sandpapering or smoothing will be needed, but you can best judge that yourself. With the surfaces as smooth as required, the first step is to apply a coat of metal primer. This should be allowed to dry over night, after which the first coat of rough stuff or filler should be applied, let stand for 24 hours, and then rub down with a rubbing stone and water. Then another coat of this primer should

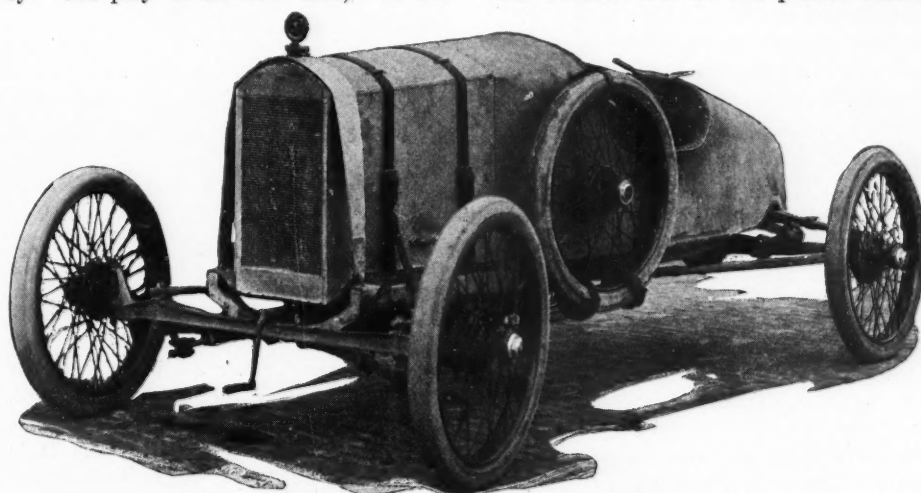


Fig. 2—Redesigned Ford car as done by a Texan

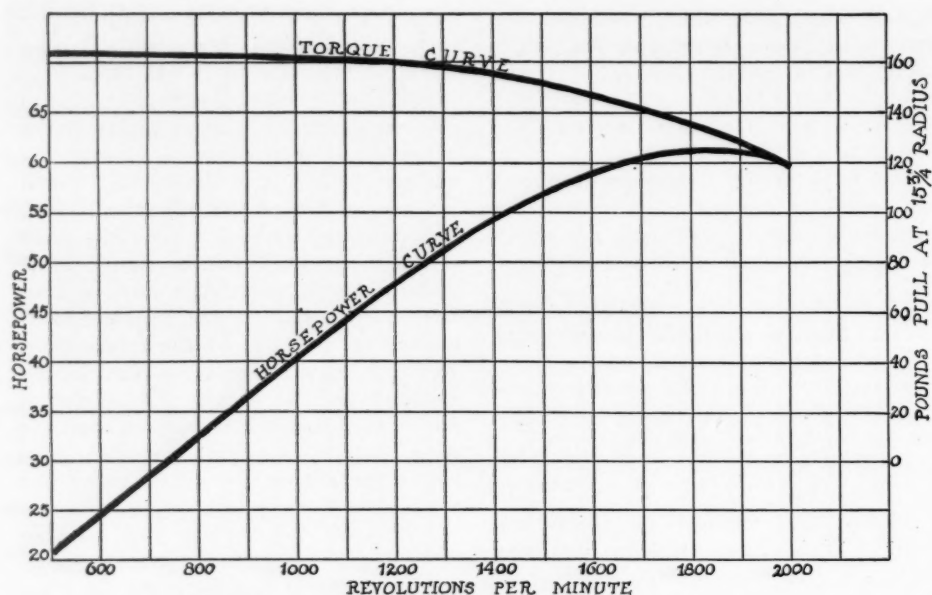


Fig. 3—Curve showing horsepower and torque at various r. p. m.

be put on, and the procedure repeated. Following this rubbing, the surface should resemble a schoolboy's slate in smoothness. You are now ready for the ground color, which is a flat color put on to give a sort of foundation for the color varnish. It should, of course, be of a shade to correspond with the desired final appearance of the car. Then a coat of color varnish is applied, and after dry, the rubbing with rubbing stone and water is again in order. Finally, put on a coat of clear finishing varnish that is of the right shade to correspond with the color. This is a lengthy procedure, and of course could be simplified if you were not after a very fine finish. However, if the above directions are followed, the metal surfaces should look like new.

3—Long tests have been carried out by the car manufacturers using them, and they must have been entirely satisfied with the wearing qualities, as compared with iron, to warrant their using these pistons. The alloy is of a composition calculated to resist wear satisfactorily.

4—Toledo, Flint and Indianapolis, from the standpoint of total cars built per year.

#### LIGHTING SYSTEM FOR EXTRA DUTY Would Remove From Car and Operate with Gas Engine

Adair, Ill.—Editor Motor Age—Is it possible to take a lighting system from a car and attach it to a small gasoline engine? If so, show by diagram how the binding posts of a 1912 Vesta magneto should be coupled to the battery, and from the battery to the lights.

2—What kind of current would result? Would it be practical?

3—Would a 22-inch flywheel be too much running at moderate speed?

4—How can one tell when the exhaust valves of a gasoline engine are too tight or too loose?—Rex Rexroat.

1—It is possible to take the lighting system from a car and attach to small gasoline engine. Fig. 5 shows the manner in which to make the necessary connections.

2—The Vesta generator develops direct current which is necessary to charge a battery. It is practical.

3—With reference to the 22-inch flywheel. You do not state at what speed the motor runs. The Vesta generator will give 6 amperes at 1,250 r. p. m. The speed can be regulated by the diameter of the generator pulley in relation to the flywheel on the engine, figuring out the speed so as to give 1,250 r. p. m. on the generator. For instance: If the motor runs 600 r. p. m. with a 22-inch flywheel the generator pulley should be about 10 inches in diameter.

4—There should be a clearance of not over .005 inch between the tappet and the end of the valve stem. This is approximately the thickness of a fairly heavy piece of paper. Place this paper between the stem and tappet and then set the tappet adjustment so that the paper can just be withdrawn without tearing. This adjustment should, of course, be made when you are sure the valves are completely closed.

#### HAS ELUSIVE LEAK IN E. M. F. Possibly Insufficient Clearance Between Tappets and Valve Stems

Grand Mound, Ia.—Editor Motor Age—We have a 1911 E-M-F 30 on which we cannot get compression on No. 3 cylinder, in fact not very good on any of them. First we put in two Ever-Tight piston rings that did not help, so we took valve grinding compound and ground in a .0004 of an inch oversize piston which seemed to fit good, put in new rings with a  $\frac{1}{16}$ -inch space between ends, ground in new valves and examined head for cracks, but found none. We put on a Rayfield carburetor and cleaned magneto. The car hits good, but has no power. Can Motor Age tell us what else to do to help it?

2—Where can we get short exhaust pipes for Fords as shown in Fig. 2 of the November 25 issue of Motor Age?

3—Does Motor Age think it advisable to grind in new pistons on a 1912 car with valve grind compound or send block to Ford Motor Co., Chicago, and have them ground and fitted there? What would the charges be?—E. W. Anderson.

1—It might be that you have not sufficient clearance between valve tappets and the valve stems, thus holding the valves open slightly when they should be closed. These should be adjusted so that there is about  $\frac{3}{32}$ -inch play between them. It is probable that all of the cylinders are somewhat out of round, so that, no matter

how good the rings, etc., there is still leakage past the pistons. It might be well to have the cylinders re-ground, fit new over-size pistons, and non-leak rings. Undoubtedly you would then have good compression.

2—Motor Age does not know exactly where these could be obtained, but possibly some of the supply houses advertising in the Clearing House part of the advertising section of this magazine could supply you. Otherwise you would have to have them made from steel tubing.

3—Do not use any sort of valve grinding compound to grind in pistons. To lap them in, it is simply necessary to run the engine for some hours under outside power. Undoubtedly a better job would be done by sending the cylinders to the service station. We cannot give you the cost.

#### HORSEPOWER OF BUDA MOTOR National Newport Car Source of Inquiry—Speed and Gear Ratio

San Francisco, Cal.—Editor Motor Age—Show the horsepower curve of a 3 $\frac{3}{4}$  by 5 $\frac{1}{2}$  Buda motor, such as is used in the National Newport, 1916 model.

2—What is the maximum r. p. m. of this motor?

3—What is the gear ratio?

4—Under favorable conditions how many miles per hour should this car show? I have seen the car do 64 miles per hour, top and windshield up, carrying four passengers, but 68 miles per hour has been claimed for it. Is it possible?—Tengo Huevos.

1—See Fig. 3.

2—The curve shows the maximum horsepower at about 1,900 r. p. m. The actual horsepower maximum r. p. m. is determined by the load. At speed and gear ratio given below motor is turning about 2,500 r. p. m.

3—Twelve to 49 gear ratio, or 4.08 to 1 with 36-inch tires.

4—The company claims 65 miles per hour and states it has known the car to do better.

#### SUBSTITUTING ALUMINUM FOR IRON Wants to Know Why Change Cannot Be Made—Expense Main Reason

Austin, Tex.—Editor Motor Age—Is there a motor car manufactured having all the apparatus needed in touring?

2—Is there any reason why aluminum castings cannot be used in place of the heavy cast iron exhaust manifolds?

3—What size tires are used on the Stutz, Maxwell and Peugeot racing cars which won prizes in the events of 1915?

4—Since the displacement of the pistons working on opposite throws of a crankshaft is equal, why does the air or gas pass in and out through the breather tube as the crankshaft revolves?—R. B. Sisk.

1—While most cars that are turned out from the factory are equipped with most of the apparatus necessary for short tours, very few of them or perhaps none of them are equipped as any one in particular might want them for long runs. Were it attempted to put in all the equipment which might be desired, the cost price naturally would be higher, and it is thought better to permit the owner to select his own equipment designed particularly for touring.

2—The first reason that aluminum castings are not used in place of cast iron exhaust manifolds is that of expense. It is

not believed that the aluminum castings will give any better results, and the saving in weight would be slight, and the expense would be increased rather out of proportion to the saving in weight.

3—The tires used on these cars were as follows: Stutz, 33 by 5; Maxwell, 33 by 5; Peugeot, 34 by 4½.

4—The air would not pass in and out through the breather tube to as great an extent were it not for the fact you mention.

### CHANGING MAGNETO TO OVERLAND Clockwise Interrupter Must Be Substituted for Anti-Clockwise

Inavale, Neb.—Editor Motor Age—I have a Bosch high-tension magneto which was made especially for the Ford and which runs the opposite way from the magnetos used on other cars. I want to put this magneto on an Overland. Can Motor Age tell me of any way to change this magneto without changing the gears and make it work on an Overland car? The Overland magneto shaft turns toward the engine and the other one turns the other way.

—C. E. Arnold.

In order to alter the Bosch high-tension magneto from anti-clockwise to clockwise rotation, it will be necessary to substitute the clockwise interrupter for the anti-clockwise one, as well as to change the interrupter lever and reset the distributor gear.

As this work involves the removal of the end plates, you will find it more satisfactory to have the work done by the nearest service station of the Bosch company. The cost of the work will depend upon the condition of the parts which are to be replaced.

### Valve Lifter for Fords

New Harmony, Ind.—Editor Motor Age—Fig. 4 is a sketch of a valve lifter for Ford cars. It is made of ⅞ round soft steel; the handle is of ⅞ by ⅝-iron or steel.—James Baldwin.

### WHEN WAS FIRST MOTOR CAR RACE? Reader Seeks General Information on Racing Subject

Reno, Nev.—Editor Motor Age—When was the first motor car race run, and where? Who was the winner?

2—Give a list of winners of the Phoenix-Los Angeles road race from the first race to the last and what make of cars.

3—What was the first big race in which O'Donnell drove?

4—Why didn't the F. R. P. and the Mercer run in the Astor cup race?

5—Who first owned the Blitzen Benz? Why doesn't it get in any big races?

6—Where and who owns the Jumbo Benz which Tetzlaff drove on the salt beds of Utah last year? What is its piston displacement?

7—How fast can the little Briscoe go that Disbrow drove at Denver this year?

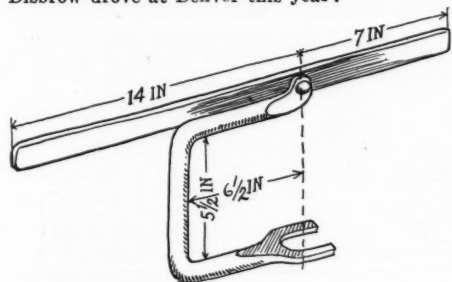


Fig. 4—Valve lifting device for Ford cars, that is simple to make

### Communications Received and Inquiries Answered

J. C. .... Chicago  
W. W. Meirs ..... Philadelphia, Pa.  
Subscriber ..... Saranac Lake, N. Y.  
A Reader ..... St. Paul, Minn.  
C. A. Graham ..... Amarillo, Tex.  
George T. Bishop ..... Sherman, Tex.  
Charles T. Hamilton ..... Decatur, Ill.  
G. B. Cook ..... Flora, Ind.  
X. Y. Z. .... Mt. Carmel, Ill.  
Rex Rexroat ..... Adair, Ill.  
E. W. Anderson ..... Grand Mound, Ia.  
Tengo Huevos ..... San Francisco, Cal.  
R. B. Sisk ..... Austin, Tex.  
C. E. Arnold ..... Inavale, Neb.  
James Baldwin ..... New Harmony, Ind.  
Johnnie Webster ..... Reno, Nev.  
E. M. Howard ..... Gibbs, Mo.  
Reader ..... Portland, Ore.

No communications not signed by the inquirer's full name and address will be answered in this department.

8—Who is considered the best speedway driver in Europe?

9—Do they hold races on the Brookland track, or do they use it for speed trials?—Johnnie Webster.

1—The first race in Europe was held in 1894, known as the Paris-Rouen trials and won by Count DeDion in a DeDion. The first American race was held a year later in Chicago and was won by Carl Muller's Benz.

2—1908, H. D. Ryus and F. C. Fenner, White Steamer; 1909, Louis and Joe Nikrent, Buick; 1910, Harvey Herrick, Kissel; 1911, Harvey Herrick, National; 1912, Ralph C. Hamlin, Franklin; 1913, Olin Davis, Locomobile; 1914, Barney Oldfield, Stutz.

3—Eddie O'Donnell's first big race was the Corona contest of 1914 when he finished third.

4—The F. R. P. cars and the Mercers busted up in practice for the Vincent Astor cup race and were scratched. Their poor showing is ascertained to lack of proper materials for parts.

5—Barney Oldfield was the first owner of the Blitzen Benz. Because of its large piston displacement, it is not eligible for the 300-inch speedway events and road races.

6—The Jumbo Benz is owned by Ernie Moross. Its piston displacement is 1,320 cubic inches.

7—The best speed ever made by the Briscoe is a mile in 50½ seconds but according to the maker, it is capable of doing 107 miles per hour.

8—On his showing during 1915, Dario Resta probably is the best speedway driver in America. Boillot is considered the king of all European road race drivers while Jules Goux and Jean Chassagne are the premier speedway drivers. It is difficult to say which is the better.

9—Until the outbreak of the European war, races were held on the Brooklands track as well as speed trials, but the competition was over short distances.

### Steel or Aluminum for Bodies

Gibbs, Mo.—Editor Motor Age—I am building a car into a roadster and would like to know what material to use for a cowl, and what thickness or gauge.—E. M. Howard.

You could use either steel or aluminum

for this. The sheet steel employed by body makers runs anywhere from 18 to 22 gauge, and the sheet aluminum from 16 to 18 gauge.

### ADJUSTING BUICK 24 REAR AXLE Wants Information as to How Backlash May Be Eliminated

Portland, Ore.—Editor Motor Age—I have noticed an article in a recent number of Motor Age on checking up the back lash in the differential gears and wish to ask for instructions on adjusting the same on a 1913 Buick 24. I have had the same apart but cannot remember noticing any means of adjustment.

2—What is the best method of drilling out and bushing the spring shackle hangers which are riveted on the frame at the front end of the rear springs?

3—I wish to install an Apeldo dynamo under the hood at the front left side to handle the electric lights and charge my storage battery. What form of drive will be best and what method of automatic cutout will give the least trouble?—Reader.

1—There is but one rear axle adjustment of this car. Remove the inspection plate on the left front side of the differential housing, and determine which way the pinion must be moved to correct the mesh and have the heel of the ring gear and that of the pinion flush. Take off the small cover plate on the right side of the end of the torsion tube. This is just ahead of the flange and differential housing. In order to move the pinion back or forward, the propeller shaft must be moved. So the next step is to take off the spring lock that fits around the adjusting nut just ahead of the pinion bearing, and also the spring lock on the adjusting nut that is just ahead of the front bearing of the drive shaft and at the front end of the torsion tube. If the pinion is to be moved toward the ring gear, loosen the forward nut and tighten the rear nut, being careful to turn both nuts an equal amount so as not to disturb the adjustment of the ball-thrust bearings which are ahead of the roller bearings at front and back of the drive shaft. Turn the adjusting nuts an equal amount in the opposite direction if the pinion is too deep into the gear. Be sure to replace the spring locks before finishing the job.

2—You might use an electric drill, but perhaps the best way would be to hammer it out with a short piece of steel. Then a new bushing of the proper size should be forced in. This should be turned down on a lathe to the correct outside diameter to fit into the hanger, and its inner diameter should also be correct to properly take the spring bolt.

3—The Apeldo outfit includes the proper cutout for the system, and you need not trouble about it. Drive from pump shaft.

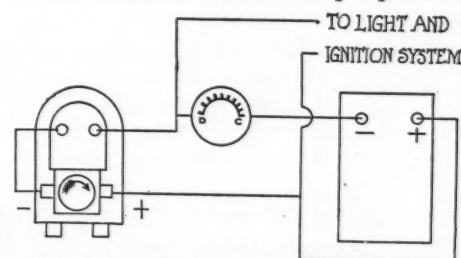
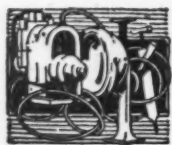
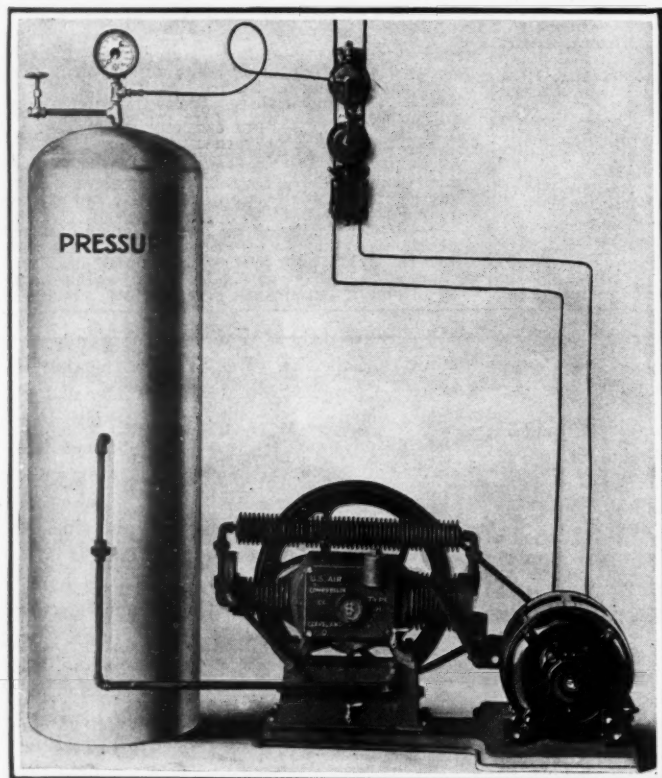


Fig. 5—Wiring diagram showing connections between Vesta magneto and battery and lights



# The Accessory Corner



United States, two-stage electric air compressor

## U. S. Air Compressor

UNITED STATES Air Compressor Co., Cleveland, O., is marketing the U. S. two-stage air compressor electrically operated, the equipment consisting of a motor, pump and tank as shown in the illustration at the top of this page. Two sizes are offered, one known as the H-34 and the other H-44.

In the H-34 the cylinders are 3-inch and 1½-inch, each having a 3-inch stroke with an air capacity of 5,000 cubic inches per minute. One-half horsepower is required to operate the pump and the floor space occupied by the device is 16 by 50 inches. The shipping weight of this model is 350 pounds.

The model H-44 has cylinders measuring 4 and 2 inches, each having a 4-inch stroke and the air capacity of 15,000 cubic inches per minute. It requires one horsepower to operate. Floor space occupied is 22 by 50 inches and the shipping weight is 550 pounds.

Equipment of the model H consists of the two-stage compressor, oil trap, safety valve, motor, wired for any current, automatic belt tightener and endless belt, all of the equipment being mounted on a large metal sub-base.

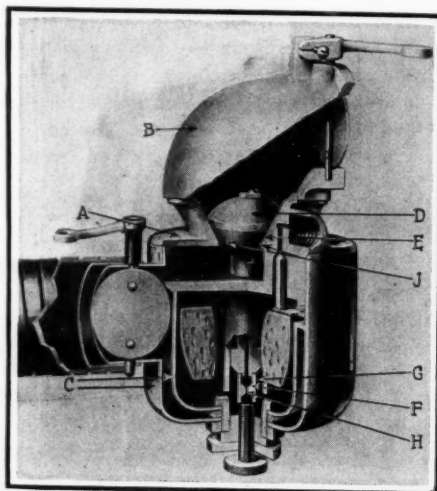
## Browne-Branford Carburetor

Among the recent developments in the field of carburetion is the Browne-Branford carburetor made especially for Fords and

other light cars and distributed by the Holt-Welles Co., Inc., 1790 Broadway, New York.

This carburetor is simple in construction yet is said to come very close to the constant air-gas ratio. It is of the concentric type and its operation is on the constant vacuum principle. The vacuum within the carburetor is always maintained at a pressure equal to the weight of the valve which forms a true venturi section with its seat and lowers the resistance within the carburetor. The air enters the mixing chamber at this point, where its velocity is greatest, and picks up the gasoline from a series of holes at the periphery of

the air valve. This makes for a better atomized condition of the fuel and air.



Brown-Branford carburetor



Meyer truck chain connector

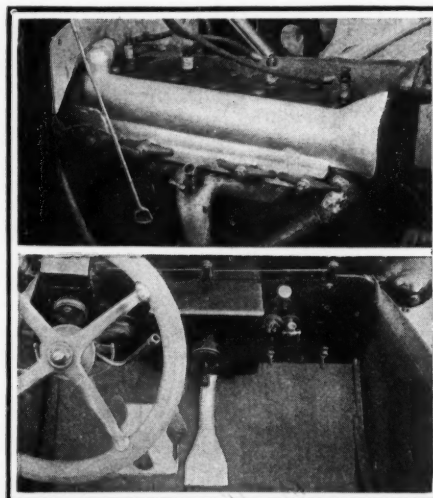
The amount of fuel is controlled by the velocity of the air passing the fuel nozzles and it is said to be possible to maintain a practically uniform mixture throughout the entire speed range of the motor.

Another interesting feature is the hot air bowl surrounding the fuel chamber. The hot air is drawn from the exhaust manifold through a flexible tube, a section of which will be noted in the illustration in this department. This hot air circulating around the fuel chamber increases the volatility of the fuel and supplies the latent heat of vaporization.

The only moving part of this carburetor is the valve. There is only one adjustment to make, that for idling, and when this has been made, by turning the thumb-screw, the carburetor is guaranteed to give a practically constant mixture under all speeds and under all conditions. This carburetor is sold on a 30-day trial basis, with the owner as the final judge as to whether or not it gives satisfaction. In addition a rebate of \$2 from the regular price of \$10 is given if the person turns in his old carburetor.

## Brickey Heater

The Brickey Auto Heater Co., Valley City, N. D., is making a car heater the method of attachment being shown elsewhere in this department. With this device the exhaust pipe is not cut but a steel jacket is made to fit over the manifold or exhaust pipe with a bell or funnel opening pointing toward the fan. At the other end of this jacket is connected a flexible tube which is made to enter the car through the dash and close to the floor boards of the front compartment. At the end of the tube entering the car is a small foot plate radiator. When the car is moving the fan drives a current of air through



Upper view shows the manifold jacket of the Brickey heater and the lower is of the foot plate in driver's compartment

the jacket which becomes warm from the heated manifold.

These devices are being built for Ford cars but it is planned to make them for other models sometime this year. Price, \$6.

#### Ohmer Taximeter

The Ohmer Fare Register Co., Dayton, O., is marketing the Ohmer taximeter which is shown in this department. This device may be likened to a cash register in that it gives the taxi user an itemized printed receipt for the fare paid. In addition a detailed printed record is kept inside the machine which contains all of the necessary information as to the operation and business done by the taxicab upon which the taximeter is mounted. Both the ticket and record are non-tamperable, being printed with indelible ink.

In addition to furnishing a printed record and tickets the meter is provided with visible indicators which show the fare paid in dollars and cents and also any charge that might accrue as extras such as hauling baggage or elapsed time waiting. These visible indications are made by numbers mounted on wheels, the figures being magnified by lenses covering them.

#### Kimball Blowout Armour

The Kimball Tire Case Co., 2801 Broadway, Council Bluffs, Ia., is making a blowout clasp which is shown in this department. These clasps offer protection to tires that have been worn or cut and since they clasp directly to the rim along with the tire, are easily held in position. Several of them may be applied side by side if the blowout requires it.

#### Jones Pneumatic Spring

How to secure pneumatic tire action with solid tires is a question which has been the subject of a number of inventions during the last few years. A very ingenious method of solving the question is suggested by the Jones Pneumatic Tire Spring Co., New York, which, as the name implies, incorporates the pneumatic action with the spring, although the car itself is equipped with solid rubber tires.

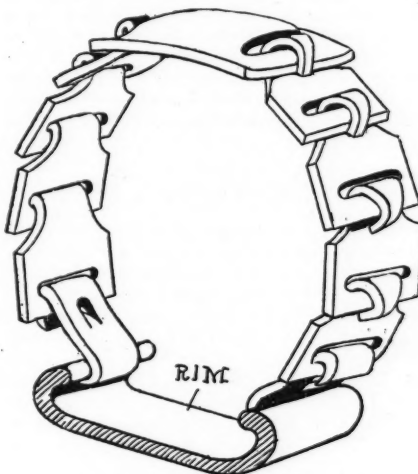
In other words, the Jones pneumatic tire spring utilizes the principle of the pneumatic tire as a cushion, but takes it away from the road thus eliminating wear on the pneumatic unit from riding friction, blowouts, rim cuts, punctures and

other familiar tire troubles. The device can be attached to any car without mechanical changes, simply by removing the spring clips and installing the Jones axle clips.

The pneumatic cushion is slung beneath the axle in such a way that the upward or downward thrusts on the spring are communicated to it by the pneumatic medium, while the car itself is equipped with solid tires. The pneumatic units are not subjected to any wear except that due to cushioning shocks and they can be kept to any desired pressure by inflating through the valves with which they are equipped.

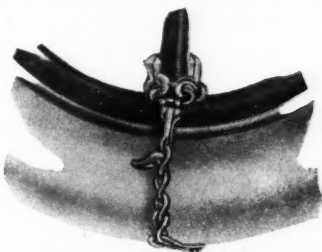
#### Meyer Chain Connector

It is always a great deal of trouble to bring the ends of a truck driving chain together when a link breaks on the road, or at any time, for that matter. It is



The Kimball blowout armor

practically an impossibility to draw the two ends together by hand in order to slip in the link pin. The tension under which a chain must be put on in order to make it run properly and not jump off the sprockets makes necessary some form of



Easyon chain made by Leather Tire Goods Co., Niagara Falls, N. Y., and described in this department December 23, 1915

mechanical device, and this prompted Henry T. C. Meyer, 285 Helen avenue, Detroit, to devise and patent a chain connecting tool that does the trick, he claims, in very quick order.

The illustration shows the connector in the act of drawing the two ends of a chain together. It works somewhat on the principle of an ordinary lifting jack. The head of the tool terminates in a hook that is placed behind the first link, and there is also a hook on the end of the lever, this catching the other end of the chain. Thus



PAY THE TOTAL OF FARE AND EXTRAS			
SEND TICKET, NAME AND ADDRESS WITH ANY COMPLAINT TO			
QUAKER CITY CAB COMPANY			
FARE	METER NO 99	EXTRAS	
0 5 30	JAN 2	1 9 6 5	1.60

Ohmer taximeter, or fare register, and ticket it prints

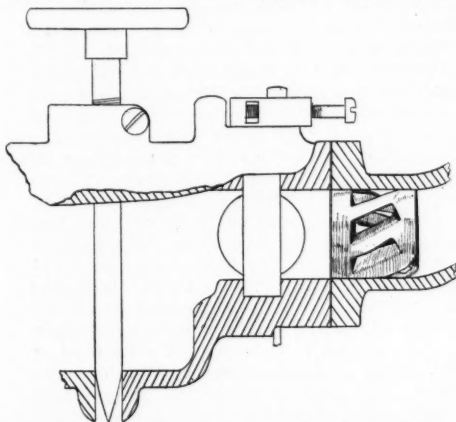
the slack in the chain is drawn up by the lever being moved forward from notch to notch in the main part of the connector, this working on the dog and ratchet principle. When the two parts of the chain are brought together, it is an easy matter to slip the pin in place. The device is made for small trucks at \$2 and for large trucks at \$3.

#### Egyptian Fuel Mixer

A simple device to reduce cylinder friction in motors and produce more power per gallon of gasoline has been invented by R. D. Loose, recently of Springfield, Ill., and now arranging to locate in Detroit. It is called the Egyptian Mixer, and is claimed to make a gasoline saving of 10 per cent.

The device changes the mixture in the carburetor by drawing all condensation from the walls of the intake manifold and sending the gasoline through the carburetor and on through the cylinders with a whirling motion of such force that the whirl continues until stopped by the compression stroke. The mixer is a sort of slotted cylinder, made of brass, with flange on one end, and is fitted into the manifold so that the connection is air tight. The inventor claims that this method of causing the mixture to enter the cylinders in a whirl instead of in straight lines or stratas prevents the uneven collection of gasoline on the cylinder walls.

Mechanics who have tested this mixing device state that it produces very good results when used on a Ford or any other car having a short manifold, while one well-known motor expert of the Curtiss aviation staff is quoted as recommending the mixer for all high-speed aero or motor car motors. The device weighs less than one ounce, and sells for \$3.



The Egyptian fuel mixer in Ford manifold

# From the Four Winds

**"DOC YAK" of Oregon**—Emil Glutsch, Portland, Ore., is the "Doc Yak" of that state on account of being granted the license No. 348, which he will carry on his car during 1916.

**Bad Checks for Tags**—Only certified checks are being accepted by the Michigan secretary of state from applicants for license number plates. It appears that quite a number of bad checks have been received and this has caused a good deal of trouble. The checks have been turned over to the attorney general's office for collection.

**Plan Subway Garage**—Plans are being drawn by the Minneapolis, Minn., city engineer for a subway garage, under Eighth street, extending four blocks. This plan is intended to take care of the machines now parked in the middle of Seventh street for two blocks. Public comfort stations would be combined. Two thousand cars is the proposed capacity. Rates for the hour, day and week are proposed.

**Limit Weight on County Roads**—The county court of Lane county, Oregon, has issued orders limiting traffic on county roads. No motor-driven vehicle having inflated tires may carry over 1,500 pounds. Horse-drawn vehicles with  $1\frac{1}{2}$ -inch tires are allowed 1,500 pounds. Vehicles with  $2\frac{1}{4}$ -inch tires are allowed 2,500 pounds; 3-inch tire vehicles are allowed 3,500 pounds and 4-inch tire vehicles are allowed 4,500 pounds.

**Minnesota Licenses 100,000 Cars**—For the fiscal year ending July 31, 1915, the motor car license department of Minnesota returned \$148,047. The cost of maintenance was \$45,149, leaving a profit of \$102,898. Most of the income was from licenses at \$1.50 for 3 years. Were the report for the 1915 year the total would be much greater as the registration is now about 100,000, many more cars than July 1. The receipts for 1914 were only \$43,781.

**Hey, Watson, Give This the O-O**—An owner of a car made back in the '80s appeared at Olympia, Wash., for a license recently, and after a hunt through the new rate book for motor cars, the secretary could not find a figure that covered a one-cylinder car. W. D. Carrier, the owner of the one-lunger said he thought it was about 10-horsepower. He knew its name, "Northern," and knew that it had but one cylinder and would carry but two passengers. The \$3 rate was finally applied.

**Move to Ban Joy Rides in City Cars**—The Central Labor Union of Wilmington has instructed its secretary to communicate with the state and sewer department and ascertain whether the department is operating any cars which are not so marked as to show that they are city property. This department, it is believed, has all of its cars labeled, but it is said there are other public cars which are not labeled, and it is the intention of the Central Labor Union, if possible, to have all cars used by public bodies plainly marked, and to have the joy riding at public expense cut out, if there is any such abuse of public cars.

**Delaware License Ruling**—Hereafter motor licenses and licenses for operators may be obtained in Wilmington, Del., only from the various magistrates—Barnet Gluckman, Thomas S. Lewis, Theodore W. Francis and Lawrence J. Broman—and Charles G. Guyer, secretary of the Delaware Automobile Association, who has his office in this city, according to an order issued by Secretary of State George H. Hall at Dover. The

notice states that numerous complaints have been received that licenses have been issued by unauthorized persons, who acted under a farming-out process from some who were authorized to issue the licenses, and because of the extensive acquaintance of some of the notaries public, they made a good thing of the practice.

**Sentence 76-Year-Old Motor Fence**—In sentencing Danforth S. Willis to 10 days in jail and fining him \$500, the police of Providence, R. I., believe that they have at last ended the work of motor thieves in that city. Willis was the fence to whom the thieves passed their cars, and he disposed of them. But the operations of the gang got too bold, and when they began to steal cars from Providence motorists and sell them to others in the same city, the police were able to trace their work. Before that there was a general system whereby cars stolen in Rhode Island were run up to Boston and sold, and others stolen there were brought back by the same thieves, making it a

## With the Motor Clubs

**Colorado A. A. Elects**—The Colorado State Automobile Association at its annual election in Denver chose the following officers for 1916: President, Elmer E. Sommers; vice-president, John Gaffy; secretary-treasurer, Charles F. Roehrig. The following directors were also elected for one year: E. R. Cumbe, C. F. Roehrig, F. P. Bertschy, Grant L. Hudson, Ralph W. Smith, Carl Ph. Schwalb, E. E. Sommers, J. Foster Symes, John Gaffy and H. A. Herrick.

**Columbus Club Elects**—The Columbus Automobile Club, Columbus, O., at its annual meeting elected the following officers for the coming year: Charles C. Janes, president; Walter A. Pfeifer, first vice-president; Ralph Hirsh, second vice-president; Ollie M. Heffner, secretary; C. Edward Born, treasurer. The new trustees consist of Edward Gettrost, H. C. Rogers, J. E. Walsh and M. A. Pixley. Mr. Janes was president of the club in 1912 and in that year many advances were made by the organization.

**Denver Club Elects**—At the Denver Motor Club's election of officers for next year, William J. Barker, 1915 vice-president, was chosen president, to succeed Carl Ph. Schwalb; Ralph W. Smith, Colorado vice-president of the American Automobile Association, was made vice-president, while Frank P. Bertschy and Charles F. Roehrig were re-elected respectively as auditor and secretary-treasurer. The following five were elected as directors for a 3-year term: Frank P. Bertschy, Carl Ph. Schwalb, E. R. Cumbe, E. E. Sommers and Dr. J. N. Vroom.

**Club Issues License Certificates**—A branch license bureau has been established at the headquarters of the Cleveland Automobile Club, Cleveland, O., in the Hollenden Hotel by the secretary of state. Applications may be made to this bureau and numbers will be issued at once, on the payment of the fee in cash, but the certificate will be issued a few days later by the Columbus office. This is to check up the applicants and be sure that the correct addresses have been given. The new arrangements will make it very convenient for those who in the past have been compelled to send their applications to Columbus at the first of each year.

double haul. The small imprisonment and fine imposed upon Willis was due to the fact that he is 76 years of age, and he has been prominent in Grand Army circles because of his being a civil war veteran.

**Motor Travel Increases**—Passenger travel by motor car since the advent of the jitney has increased in Seattle, Wash., according to figures compiled by the superintendent of public utilities. Passenger traveling on motor vehicles increased 12,433 this year as compared with 1914. Passengers riding on street cars decreased 12,752.

**Prohibition Taxes Garages**—Gasoline stations located so that cars must cross a sidewalk for service will be taxed \$50 a year in Tacoma, Wash., beginning January 1. Those in garages or on street parkings will be taxed \$10 a year. The taxes derived from this source are to provide revenue for the city, on account of the dry law which went into effect January 1.

**Ohio Ranks Second in Cars**—Showing an increase of nearly 50 per cent, the number of cars owned in Ohio in 1915 jumped to 181,310 from the previous year's number, 122,504, according to figures given out by H. W. Walker, Ohio registrar. Ohio ranks as the second state in the country in the number of cars. New York alone surpasses it. Of the counties, Cuyahoga ranks first, with 26,719; Hamilton second, with 11,995; Franklin third, with 9,287; Lucas fourth, with 8,022, and Montgomery fifth, 6,160.

**Owners Fight Ordinances**—Owners of cars in Rockford, Ill., are up in arms over a proposed wheel tax ordinance, introduced at the last session of the city council. It is charged that such an act would drive many car owners away from the city. The Rockford Motor Club is conducting an active campaign against the measure. Efforts are being made to have a traffic ordinance adopted to check the practice of pedestrians cutting diagonally across streets at intersections. A section requiring lights at night upon vehicles of every type also is favored.

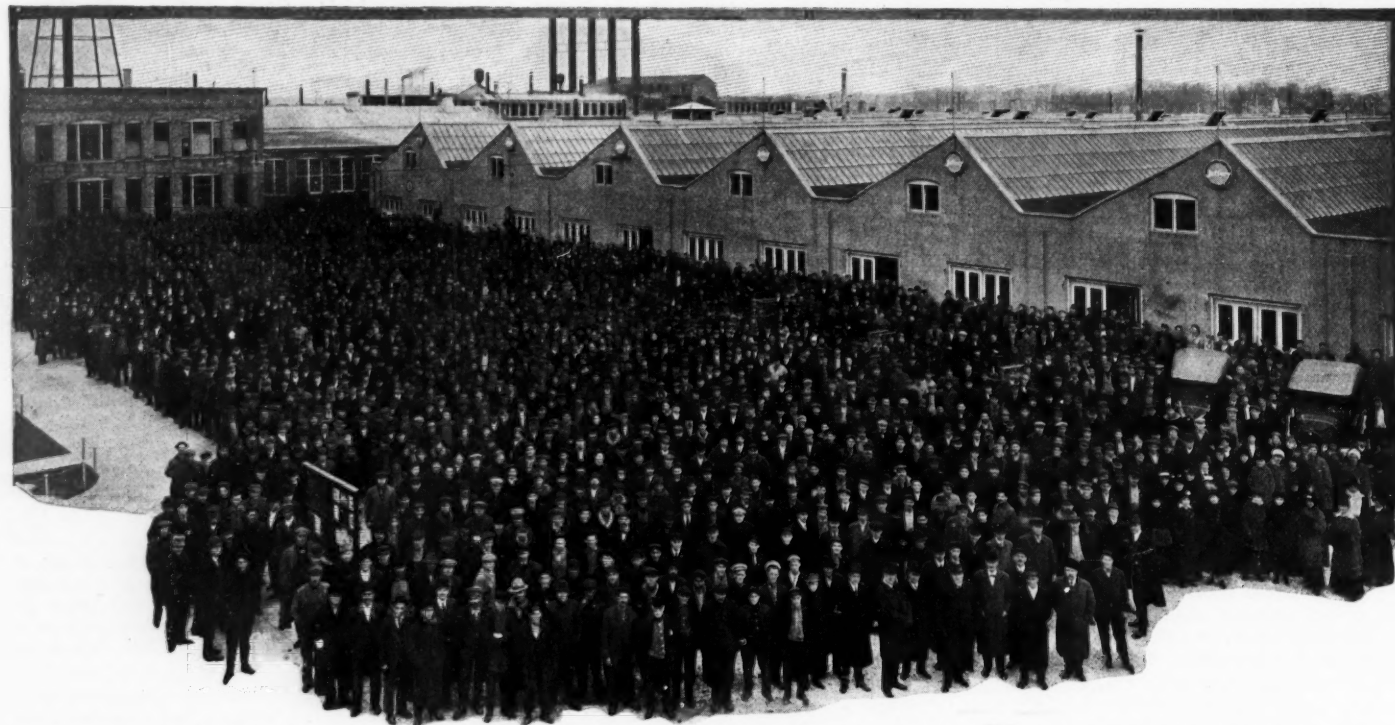
**Railroads Study Losses**—Officials of the St. Louis & San Francisco Railroad, the headquarters of which are at Springfield, Mo., are combining with other main-line roads in Missouri in an effort to determine what effect the general use of motor cars has had on passenger receipts. Exact figures are hard to obtain, but the railroad knows it has been badly hurt, the greatest loss being on short-haul passengers. Missouri now has about 76,000 licensed cars, a gain of 30,000 over last year, and the state license department has ordered 100,000 licenses for distribution next year.

**Fine Point of Law Involved**—Because of alleged "needless backfiring," George L. Swank, a chauffeur, was arrested in St. Louis, Mo., and charged with general peace disturbance. Robert J. Parks, manager of a gasoline filling station where Swank was arrested, also was taken into custody by the police because of his alleged use of "objectionable language" in commenting on Swank's arrest. The police are now looking for someone who can give "expert testimony" that the backfiring of Swank's cars was "needless." They are also looking for someone to whom Parks' language was "objectionable." According to a St. Louis ordinance a person cannot be charged with disturbing the peace of a policeman or with using language objectionable to a policeman. It must be a civilian whose peace is disturbed before an offense has been committed.





# Among the Makers and Dealers



**JEFFERY EMPLOYEES FACE THE CAMERA**—Prosperous business condition is graphically illustrated in the above photograph which shows 2,700 employees of the Thomas B. Jeffery Co., Kenosha, Wis., assembled at the noon hour in the courtyard back of the Jeffery offices. The Jeffery company this year is employing, including the night shift, nearly 3,000 men as compared to 1,300 a year ago. During the first 6 days of December the Jeffery

company shipped more cars than were shipped during the entire month of December a year ago. This tremendous increase in business during a month which is generally considered a slack period is due primarily to three factors—a greatly increased domestic business in passenger cars and trucks—a heavy demand from foreign countries which have heretofore been supplied by the warring nations—and the introduction of the Jeffery sedan.

**TOPKEN Goes to Tacoma**—F. W. Topken, for 11 years chief designing engineer of the Chicago Pneumatic Tool Co., now is in charge of the mechanical and garage departments of the Hunter-Smith Sales Co., Tacoma, Wash.

**Kelly-Springfield May Move**—The Kelly-Springfield Tire Co., Akron, O., may move its Akron plant to a new one in Springfield, O., according to plans of the company. Though at the present time no suitable location has been obtained in that city the officials of the concern have been negotiating for the purchase of land there upon which to erect new factory buildings.

**Van Ness Leaves Great Western**—F. W. Van Ness has resigned as general manager of the Great Western Automobile Co., Peru, Ind. Mr. Van Ness is an experienced engineer, having been connected with the Allis-Chalmers Co. and other large concerns, for whom he successfully designed and installed plants of various types throughout the country, but it is his intention to continue in the motor car line.

**Akron Annexes Goodyear Heights.**—So successful has been the homebuilding plan for employees of the Goodyear Tire & Rubber Co. that the city of Akron, O., included the whole Goodyear tract in an annexation ordinance that has just been passed, and Goodyear Heights is now a part of that city. The plan was started 3 years ago by President F. A. Seiberling, who felt that many of the 10,000 Goodyear workmen desired to become home owners, but were barred by the necessary first payment in the usual real estate deal. Thereupon 100 acres of land were purchased close to the

## The Show Circuit



**Hartford, Conn., Show**—The ninth annual show of the Hartford Automobile Dealers' Association, Hartford, Conn., will be held in the First Infantry Armory, February 12 to 19, under the auspices of the regiment and the dealers. Trucks, passenger cars and accessories will be displayed. Ben F. Smith will manage the show. Most of the space has been sold.

**Seattle, Wash., Show**—Seattle, Wash., dealers will house a show in the new Arena the week of April 10, 1916, the show to be given under the auspices of the Seattle Exhibition Co. The primary object of the exhibition is to give motor car concerns that now are represented in the Northwest an opportunity to show their cars and receive further representation. The Exhibition company agrees to give a satisfactory bond for the caring and returning of cars.

**Columbus, O., Show**—Two shows are scheduled for Columbus, to be held within 2 weeks of each other. The first show will be held in the Memorial Hall, January 13 to 18, inclusive, under the auspices of the Columbus Automobile Club and the Columbus Auto Trades Association. The other show will be held in the same hall, January 29 to February 5, under the auspices of the Columbus Automobile Show Co.

Goodyear plant, the ground was plotted, streets laid out, paved, sewerage, etc., water, gas and electric light provided for—and homes built and sold to workmen on the basis of rent, no down payment being necessary.

**Has Automatic Tire Gauge**—The Curtis Pneumatic Machinery Co., St. Louis, Mo., put on the market a device for air stations designed to provide the correct pressure for tires of various size. The motorist before filling his tire turns a dial on the device to the rated capacity of the tire he wishes to inflate and automatically gets the exact pressure designed for such a tire.

**Stanford Westcott Purchasing Agent**—Announcement has just been made by H. G. Root, general manager of the Westcott Motor Car Co., Richmond, Ind., of the appointment of E. E. Stanford, Indianapolis, as purchasing manager of the Westcott company. Mr. Stanford, who assumed his duties with the Westcott company December 27, for several years had been connected with the purchasing department of the National Motor Vehicle Co., Indianapolis, Ind.

**Firestone Appoints District Managers**—The Firestone Tire & Rubber Co., Akron, O., announces the appointment of three district managers, who will have headquarters at the home office and at the same time will work closely with the sales organization in the field. Dan C. Swander, formerly branch manager in New York, will have charge of the eastern district. He will be succeeded in New York by C. D. Studebaker, who becomes branch manager. E. W. BeSaw, formerly Des Moines branch manager, will look after the western branches.

G. A. Spohr, former salesman, succeeds Mr. BeSaw as Des Moines manager. N. B. Burwell of the home office sales department will take care of the south.

**Foster Publishes Cadillac Courier**—C. H. Foster, Cadillac distributor in Chicago, is publishing the Cadillac Chicago Courier that goes to all Cadillac dealers in his territory and to owners as well. Foster believes he is the only distributor publishing a house organ for clients.

**Porter Manages Form-a-Truck Sales**—Samuel D. Porter, formerly an official of the Maxwell, Columbia & Stoddard Dayton Motor Co., has been appointed general sales manager of the Smith Form-a-Truck Co., Chicago, maker of the Smith Form-a-Truck 1-ton truck attachments for Ford cars.

**Hupp Shows Gains**—According to Sales Manager Lee Anderson, of the Hupp Motor Car Co., Detroit, Mich., the company now has 100 per cent more orders on the books for immediate delivery, than last year at this time. Business during the last 3 months of this year was 26 per cent ahead of the last quarter of 1914.

**Bimel Spoke Adds**—The Bimel Spoke and Auto Wheel Co., Portland, Ind., maker of motor car, heavy truck and trailer wheels, is moving into its new addition, which will practically double its output for the coming year. In future the shops will be separate, making the heavy wheels in one shop and the light wheels in a special shop.

**Bucyrus Rubber Elects Directors**—The annual meeting of the stockholders of the Bucyrus Rubber Co., Bucyrus, O., was held recently at which directors for the coming year were elected as follows: P. J. Carroll, Jacob Colter, W. A. Blicke, George Donnenwirth, A. B. McVay, A. G. Stoltz, H. A. Paxton, Col. C. W. Fisher, and M. R. Lewis.

**Represents Simplex in West**—The Arnold-Stelling Co., Inc., has secured the Pacific coast agency for the Crane model Simplex cars and will open representation in San Francisco at Hotel St. Francis February 1. A sales room will be opened in March. In addition to the exclusive rights for the Pacific coast, Arnold-Stelling has all territory west of the Mississippi which is open

## Coming Motor Events

### SHOWS

January 7-13—Milwaukee, Wis., show.  
January 8-15—Cleveland show.  
January 8-15—Philadelphia show.  
January 10-15—Fort Wayne, Ind., show.  
January 13-18—Columbus, O., show.  
January 17-22—Rochester, N. Y., show.  
January 17-22—Wilmington, Del., show.  
January 18-22—Baltimore, Md., show.  
January 18-22—Lancaster, Pa., show.  
January 22-29—Montreal, Que., show.  
January 22-29—Chicago show.  
January 24-29—Portland, Ore., show.  
January 24-29—Buffalo, N. Y., show.  
January 25-27—Montgomery, Ala., show.  
January 29—Feb. 5—Columbus, O., show.  
January 29—Feb. 5—Minneapolis, Minn., show.  
February 1-5—York, Pa., show.  
February 7-12—Kansas City, Mo., show.  
February 9-12—Peoria, Ill., show.  
February 12-19—Hartford, Conn., show.  
February 14-19—Des Moines, Ia., show.  
February 20-27—Grand Rapids, Mich., show.  
February 21-26—Louisville, Ky., show.  
February 21-26—Omaha, Neb., show.  
February 21-26—Syracuse, N. Y., show.  
February 29—March 4—Sioux City, Ia., show.  
February 29—March 4—Fort Dodge, Ia., show.  
March 4-11—Boston show.  
March 8-11—Davenport-Rock Island-Moline show.  
March 8-11—Mason City, Ia., show.  
March 9-11—Kenosha, Wis., show.  
March 21-25—Deadwood, S. D., show.  
April 10-17—Seattle, Wash., show.

### CONTESTS

May 13—New York City, Sheepshead Bay speedway race.  
May 30—Indianapolis speedway race.  
June 17—Chicago speedway race.  
June 28—Des Moines, Ia., speedway race.  
July 4—Minneapolis speedway race.  
July 4—Sioux City speedway race.  
July 15—Omaha, Neb., speedway race.  
August 5—Tacoma speedway race.  
August 18-19—Elgin road race.  
September 15—Indianapolis speedway race.  
September 30—New York City Sheepshead Bay speedway race.  
October 7—Omaha speedway race.  
October 14—Chicago speedway race.

at present. Jan H. Stelling, president, has been sales manager of the DeDion in New York for 8 years, and George K. Arnold.

secretary, has been connected with the business in New York.

**Davis with McGraw**—C. E. Davis, Portland, Ore., has been appointed manager of the Portland branch of the McGraw Tire & Rubber Co., which recently established quarters there.

**Schooley Goes to Kearns**—S. W. Schooley has become associated with the Kearns Motor Truck Co., Beavertown, Pa., in the capacity of vice-president and sales manager. He was formerly special factory representative for the Atterbury Truck Co.

**To Make Mason Cars Again**—George R. Mason, formerly manufacturer of the Mason car, has opened the Mason Motor Service Co., at Des Moines, Ia., in the Mason factory and announces that he plans to resume the manufacture of Mason cars there as soon as practical.

**Riley Resigns from Studebaker**—Nelson S. Riley, for 4 years head of the Kansas City branch of the Studebaker Corp., and president of the Kansas City Automobile Dealers' Association, Kansas City, Mo., has resigned from both positions. His resignation took effect January 1.

**Reo Dealers Get Together**—Reo dealers from twenty-five Iowa counties comprising the Des Moines territory were Des Moines visitors for a get-together meeting at Des Moines, Ia., last week and were entertained by the Sears Automobile Co., Des Moines distributor for the Reo. R. C. Reuschaw, Lansing, Mich., sales manager of the Reo Motor Car Co., was the guest of honor and accompanying him from the factory were H. J. Straebler, district representative, and Mr. Brandymere, special chassis lecturer. Forty dealers attended.

**Canadian Ford Increases Sales**—It is likely that a record in motor car sales that will exceed anything heretofore accomplished in the Dominion will be hung up by the Ford Motor Co., of Canada, Ltd., at the end of the current fiscal year. Sales of Canadian Ford cars equal to nearly half of last year's total were made in the first 4 months, August to November inclusive. If orders now on file for delivery up to end of December be added, the company has sold since August more cars than during all of the last fiscal year.



**DODGE BROTHERS CAR IN UNIQUE DEMONSTRATION**—The Commonwealth Motor Co., Ltd., Richmond, Va., recently participated in a novel stunt to prove the spring strength and riding qualities of Dodge Brothers cars. At the Virginia state fair one of the track attractions was "Buhler, the Auto Fiend," who allowed a loaded motor car to run over him while traveling at a

speed of 20 miles per hour. Dodge Brothers car was selected by the fair officials to be used in the act and Louie R. Phelps, manager of the Commonwealth company, determined to take advantage of the stunt to demonstrate the riding quality of the car. He filled it with prospective buyers who were given the opportunity to see how easily the car rode over a prostrate man.

## New Garages, Repair Shops and Service Stations

Town	Firm	Supplies
Decatur	Bittel-Leftwich Co.	Garage
Prophetstown	Elbert L. Hill	Garage
Sullivan	David Shipman	Garage

## IOWA

Davenport	River-to-River Garage	Garage
Des Moines	States Auto Supply Co.	Service

## KANSAS

Alta Vista	Union Thomas	Garage
Arkansas City	A. J. Penrose	Shop
Belle Plaine	B. F. Cleaton	Garage
Cottonwood Falls	Leslie Gillaspie	Repair
Horton	Winterscheidt & Sawyer	Garage
Hutchinson	Taylor Motor Co.	Accessories
Larned	W. L. Mitchell	Charging Station
Lyndon	James Nash	Garage
Oakley	Clarence Dryden	Garage
Pratt	J. S. Price	Garage
Thayer	J. E. Frazier	Garage
Victoria	Veley & Tuttle	Garage
	Reidel & Bungardt	Garage

## KENTUCKY

Louisville	Ford Trading Agency	Accessories
Louisville	Louisville Double Tread Tire Co.	Service

## MARYLAND

Baltimore	G. E. Blaylock	Fall Tires
Baltimore	E. W. Eisensuer	Garage
Baltimore	H. O. Accessory Co.	
	Hassler Shock Absorber	

Town	Firm	Supplies
Baltimore	Mid-City Garage Co.	Garage
Baltimore	Tire Mart Co.	Dillon Lens

## MINNESOTA

Canton	F. Trip & Sons	Garage
Greenwald	M. J. Kulzer	Garage
Stillwater	Bluff City Auto Co.	Sales
Hinckley	L. T. Irons	Garage
Truman	Vic St. John	Garage
Hills	Anderson & Flessner	Garage
Donnelly	Herman Neitzel	Garage
Winger	Winger Auto Co.	Garage
Minneapolis	Fahey & Travis	Garage
Ellendale	Borgerson Bros.	Garage
Org	Lynn King	Repair Shop

## MISSOURI

Brookfield	Fred Dickinson	Garage
Cape Girardeau	Edwards, Williams & Grimes	Garage
Cassville	L. E. Fawyer	Garage
Clinton	J. W. Crews	Garage
Columbia	W. H. Mayer	Garage
Eldon	George Hite	Garage
Independence	Smith Brothers	Garage
Monett	Thomas Markel	Garage
Noel	Harmon & St. Clair	Garage
Norwood	F. J. Thompson	Garage
Owensville	Kriete & Funk	Garage
Rich Hill	Andrew Tabler	Garage
Richmond	Roy Shelly	Garage
St. Louis	H. G. Donigan	Detroit Ford Starter
St. Louis	Hruska & Schober	
	Big Six Shock Absorber	
Smithville	Waller & Williams	Garage
Urbana	G. W. Kreller	Garage

## MONTANA

Town	Firm	Supplies
Denton	Montana Garage Co.	Garage
Helena	Holbrook & Hoffman	Garage

## NEBRASKA

Omaha	Omaha White Star Co.	
	White Star Oil	

## NORTH DAKOTA

Kingsburg	Frank Potter	Garage
Temvik	P. Tempel	Garage
Elgin	Steckler & Messer	Garage
Walhalla	Henry Porter	Garage
Nome	Olaf Rudd	Garage
Hague	Conrad Erck	Garage
Litchville	H. J. Olson	Garage

## OHIO

Ashland	Scott Freer	Garage
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## OKLAHOMA

Davidson	J. B. McKinley	Garage
Sapulpa	Theodore Franzen	Garage

## PENNSYLVANIA

Philadelphia	W. H. Metcalf	Houk Wire Wheels
Philadelphia	J. R. MacClellan	McClellan Tires

## SOUTH DAKOTA

Flandreau	Amdahl Bros.	Auto Co. Garage
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## WISCONSIN

Lake Geneva	Jensen & Flack	Garage
Rice Lake	Rice Lake Motor Co.	Garage
Sheboygan	Acker Electrical Co.	
	Willard Battery	
Sheboygan	A. W. Grams	Garage
Ogema	August Struve	Garage

## Recent Agencies Appointed by Motor Car Manufacturers

Town	Agent	Make
Azusa	Knight & Burt	Apperson
Bakersfield	M. & F. Garage	Apperson
Coronado	A. B. Shaw	Scripps-Booth
Hemitt	Phillon & Sanborn	Apperson
Hollywood	Ralph Clark	Apperson
Lompoc	Bell & Canfield	Apperson
Longbeach	A. E. Evans	Apperson
Los Angeles	G. W. Sundberg	Cause
Los Angeles	B. M. Byrne	Hollier
Pasadena	F. J. Purdy	Apperson
Pasadena	A. M. Hawley	Scripps-Booth
Redondo	V. E. Savage	Apperson
Redlands	Bert Hatfield	Scripps-Booth
Redlands	Stowe Motor Car Co.	Apperson
San Bernardino	Chas. Reber	Apperson
San Dimas	J. S. McIntyre	Apperson
San Diego	A. B. Shaw	Scripps-Booth
San Luis Obispo	California Garage	Apperson
Santa Ana	Raffle & West	Apperson
Santa Barbara	A. L. Smith	Scripps-Booth
Santa Monica	Chas. Fausel	Apperson
Santa Monica	Fred D. Morse	Scripps-Booth
Upland	B. J. Caldwell	Apperson
Van Nuys	L. E. Van Patten	Apperson
Ventura	H. O. Waterman	Scripps-Booth
COLOREDADO		
Akron	C. N. Yeamans	Paige
Boulder	Frank Deckelman	Stearns
Colorado Springs	C. T. Lowndes	Paige
Colorado Springs	Ferguson & Ingersoll	Stearns

Town	Agent	Make
Edwards	A. W. Burnison	Paige
Flagler	J. H. Seal	Paige
Paonia	Joseph Carlstrom	Paige
Windsor	E. C. Hickman	Paige

## ILLINOIS

Decatur	W. L. Shellabarger & Sons	Studebaker
Pecatonica	W. R. Stone	Maxwell

## KANSAS

Belle Plaine	B. F. Cleaton	Dodge
Belle Plaine	B. F. Cleaton	Ford
Victoria	Reidel & Bungardt	Overland
Wichita	Andre & Harlow	Briscoe
Wichita	Kansas Motor Car Co.	Studebaker

## KENTUCKY

Louisville	Cherokee Motors Co.	Maxwell
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## MASSACHUSETTS

Boston	John L. Judd	Auburn
Worcester	M. N. Barrett	Pullman

## MICHIGAN

Detroit	R. S. Merrian	Mercer
Muskegon	Koebel & Bennett Auto & Supply Co.	Detroit Electric

## MISSOURI

Cape Girardeau	Edwards, Williams & Grimes	Overland
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Town	Agent	Make
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## MINNESOTA

Battle Lake	T. A. Ranstad	Buick
Little Falls	F. P. & Charles Farrow	Saxon

## MONTANA

Missoula	P. R. Hewitt	Ford
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## NEBRASKA

Sidney	W. E. Swatzlander	Paige
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## NEW JERSEY

Burlington	Russell A. Clark	Oldsmobile
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## NEW YORK

Lake Mahopac	Mahopac Garage	Oldsmobile
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## OHIO

Cleveland	Eiseman Auto Co.	Marmon
Cleveland	Safe Motor Sales Co.	Federal

## TEXAS

Livingston	George F. Sawyer	King
Sherman	P. L. Brown	King
Waco	A. W. Turner	King

## WASHINGTON

Clarkston	A. B. Avery	Oakland
Tacoma	Floyd J. Logan	Maxwell

## WISCONSIN

Antigo	John Hessel Hdw. Co.	Dodge
Ogema	August Struve	Maxwell

## WYOMING

Cheyenne	Frank H. Gleason	Paige
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Albany, N. Y.—Madison Garage; capital stock \$50,000; incorporators, J. C. Green, H. J. Green, F. R. Billman.

Annapolis, Md.—Annapolis Motor Car Co., general motor car and accessory business; capital stock \$25,000; incorporators, R. S. Noah, F. M. Duvall, M. O'Neill, B. C. Huff and Robert Combs.

Athens, Tenn.—Dixie Highway Tire Co., to manufacture motor car tires; capital stock \$25,000.

Gallion, O.—Motor Driven Implement Co., to manufacture tractors; capital stock \$50,000; incorporators, E. P. Rayl, E. D. Helfrich, R. E. Place, S. A. Wheatcraft and H. L. Rodley.

Chicago—South Side Auto Exchange Co.; capital stock \$2,500; incorporators, Erick Kullberger, C. G. Staat and J. H. Southman.

Cincinnati, O.—Auto Remedy Co., to deal in motor car accessories; capital stock \$150,000; incorporators, Herman Bumiller, Theodore Bumiller, James Ratcliff, D. W. Snyder and F. S. Starkey.

Clarksburg, W. Va.—Newcomer Auto & Supply Co.; capital stock \$25,000; incorporators, Joe H. Newcomer, Lloyd Newcomer, T. S. Newcomer, Nettie B. Newcomer and L. M. Lawton.

Cleveland, O.—DeLamatter Auto Oil Co., to deal in oils and gasoline; capital stock \$10,000; incorporators, Joseph J. Klein, George B. Harris, S. M. Davis, M. A. Close and C. Griffin.

Cleveland, O.—McLean Tire & Rubber Co.; capital stock \$300,000; incorporators, Sterling Newell, G. W. Greene, H. F. Reid, L. S. Buchan and M. J. O'Connor.

Cleveland, O.—Overland-Nottingham Co., to sell motor cars and do a general garage business; capital stock \$10,000; incorporators, M. L. Bridgman, F. C. Hartman, H. L. Hartman, Jacob J. Larick and Nellie B. Larick.

Columbus, O.—Autowasher Mfg. Co.; capital stock \$10,000; incorporators, Charles E. Holmes, Robert J. Smith, R. C. Marshall, C. C. Pavey and Ivor Highes.

Davenport, Ia.—Bashaw-Joy Co., to sell and repair gasoline and electric cars; capital stock \$15,000; incorporators, Wayne S. Bashaw and Guy Joy.

Detroit, Mich.—Frontenac Motor Co.; capital stock \$25,000; incorporators, Louis J. Chevrolet, James Boyer, Jr., and William Small.

Detroit, Mich.—H. & H. Garage & Sales Co.; capital stock \$5,000; incorporators, Elmer Hangsteper, W. S. Duncan, Emma L. Duncan.

Dover, Del.—American Auto Accessories Co., to manufacture, sell and deal in and with pneumatic tubes, tools and kits; capital stock \$5,000,000; incorporators, J. F. Curtin, S. A. Anderson, S. B. Howard.

Greenville, O.—Inter State Sales & Supply Co., to deal in motor cars and accessories; capital stock \$5,000; incorporators, Ira McGriff, George W. Mannix, Jr., T. A. Billingsley, J. L. Williams, T. E. Shafer.

Jackson, Mich.—Imperial Sales & Parts Co., capital stock \$30,000.

Kansas City, Mo.—Rice-Sturtevant Co.; capital stock \$2,000; incorporators, L. M. Sturtevant, L. D. Rice, W. Haley Reed.

Kansas City, Mo.—Times Square Automobile Co., to deal in motor cars and supplies with garage in connection; capital stock \$15,000; incorporators, Morris Froehlich, Jesse Froehlich, Louis Mensbach, Charles C. Carroll, M. B. Aaron and W. H. Maloney.

Los Angeles, Cal.—Portage Rubber Co.; capital stock \$180,000; incorporators, John G. Boss, R. K. Boss, L. M. Evans.

Los Angeles, Cal.—Stone-Dancey Motor Sales Co.; capital stock \$25,000; incorporators, J. G. Dancey, L. M. Beer, Anna F. Stone.

Louisville, Ky.—Auto Credit Sales Co.; capital stock \$10,000; incorporators, E. S. Tachau, J. W. Brooks, G. A. Brandt.

Milwaukee, Wis.—Henes Garage Co., to conduct and operate a garage and repair shop, capital stock \$1,500; incorporators, G. L. Henes, Charles Funk and J. S. Brennan.

Milwaukee, Wis.—United States Electric Tool Co., to manufacture and deal in machinery, tools, etc.; capital stock \$25,000; incorporators, John C. Zeman, F. J. Ramler and Frank Kraemer.

Minneapolis, Minn.—Knights & Wickham Co., to make and sell accessories; capital stock \$25,000; incorporators, F. A. Wickham, R. W. Knights and M. E. Briggs.

Minneapolis, Minn.—Minneapolis-Automobile Owners' Protective Assn.; capital stock \$100,000; incorporators, F. E. Holton, T. T. Warham, B. F. Ward, F. E. Holton, E. G. Terwilliger.

New York—Lee Rubber & Tire Corp.; capital stock \$750,000; incorporators, R. E. Corcoran, E. Roeder, J. Gru.

Peoria, Ill.—Peoria Automobile Club; capital stock \$25,000; incorporators, W. E. Hull, Val Jobst, Jr., S. K. Hatfield.

Racine, Wis.—Common Sense Truck Co.; capital stock \$50,000; incorporators, G. H. Wheary, H. S. Hartmann and L. S. McDonough.

Rockford, Ill.—Majestic Garage Co.; capital stock \$2,500; incorporators, F. E. McFarland, W. S. Merritt, W. C. Merritt.

Seattle, Wash.—Ghent Motor Co.; capital stock \$2,000,000; incorporators, G. A. Ghent, O. L. Brackett, J. Blumberg, E. N. Winslow and J. H. Kugler.

Seattle, Wash.—Otterson Auto Educator Co.; capital stock \$250,000; incorporators, J. Grattan O'Bryan and G. W. Otterson.

Sebring, O.—Sebring Tire & Rubber Co.; capital stock \$200,000; incorporators, F. A. Sebring, Fred Sebring, E. M. Stanley, H. D. Weaver, Bart Green and J. S. Hotchkiss.

Sioux Falls, S. D.—Rud Motor Car Co.; capital stock \$25,000; incorporators, O. L. Rud, E. Klavness, Harry Hofweid.

St. Louis, Mo.—Shurnuff Mfg. Co., to manufacture parts and accessories; capital stock \$12,000; incorporators, Thomas M. Taylor, J. P. Parker, J. F. McCarthy.

Youngstown, O.—Mahoning Auto & Tire Co.; capital stock \$15,000; incorporators, C. A. Huffman, E. A. Singleton, C. D. Wright, H. P. Shoten and G. F. Hammond.